

CITY OF TERRE HAUTE

STANDARDS AND SPECIFICATIONS

Adopted : March 13, 2006

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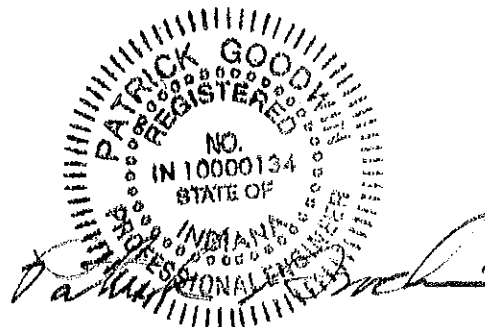
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Prepared By:
Department of Engineering

Chapter One: General Construction Specifications

1.1 Overview

The purpose of this chapter is to outline the City of Terre Haute's requirements pertaining to construction within the public right-of-way. It is intended to act as a guide for sound construction procedures. In all cases, the latest edition of the Indiana Department of Transportation (INDOT) Standard Specifications will be enforced on city projects. Where there is any apparent conflict between the City and INDOT Standards, the City Standards will hold precedence.

1.2 License Requirements

Each person or entity to perform work within a City right-of-way must obtain a license through the Department of Engineering. The license shall be valid from January 1st through December 31st of the year in which they are purchased.

Each person or entity applying for a license or renewal of license to work within a City right-of-way under Municipal Code 8-120 shall file with the Engineering Department proof of liability insurance in the minimum amount of one million dollars (\$1,000,000) for bodily injury or death and one hundred thousand dollars (\$100,000) for property damage. Such insurance shall provide that the City is additionally insured under its provisions.

Each person or entity granted a license to engage in work in the right-of-way of the City shall give a bond to the City of Terre Haute in the penal sum of \$25,000 with surety to be approved by the City Controller, conditioned for the faithful performance of his, their, or its duties, according to the terms of the City Municipal Code, which bond shall be for the term of one year and shall be renewed annually upon renewal of the license provided.

Each person or entity doing excavation or construction for hire on private property is required to have a bond on file at the Engineering Department in the amount of \$10,000. In addition, a General Contractor's License is required of any person or entity performing construction for hire to the public.

1.3 Permit Requirements

Before any excavation or construction may take place within the public right-of-way (street, alley, tree-row, sidewalk, driveway approaches), an application must be made in writing to the Department of Engineering on the appropriate permitting form, Form 5.1 in Chapter 5 (page 28) in this manual. Sketches of the proposed work shall be furnished

with the application as needed. In the event of an emergency, notification will be given to the Department of Engineering at the time repair crews are dispatched. If work is required outside business hours, the Department of Engineering is to be contacted the following business day at 8:00 A.M. Permits must be kept on-site when right of way work is being performed. If permitting is not on site, work will be stopped and violators will be subject to fines and license suspension. Right-of-way permits will be open for a period of 90 days from the time of purchase. All right-of-way permits shall be activated within this 90-day period by contacting the Department of Engineering. Once the permit is activated, the permit owner will have a period of five (5) working days to excavate and restore area as specified. Extensions may be applied for by contacting the Department of Engineering. If a permit is not activated within 90 days after purchase, the permit is void. If a road closure is required a requests for road closure shall be submitted in writing to the Board of Public Works at least 10 days prior to the proposed closing date. Fees for permits are detailed in section 8-122 of the Municipal Code and are shown on Form 5.1.

1.4 Right-of-Way Work Completion

Once right-of-way work is complete the permit holder shall be responsible for the work to meet or exceed the City General Construction Specifications for a period of **three years**. If the work is found to be in noncompliance the permit holder shall be contacted by the Department of Engineering and will be given a specified time limit to repair the defects; failure to comply will result in penalties as per Municipal Code section 8-124.

1.5 Time Restrictions on Work Hours

Adjacent properties shall have access to the abutting street between the hours of 6:00 PM and 8:00 AM unless notice has been given to the property owner and occupant at least 5 days prior to work.

On major thoroughfares designated in Chapter 5 (page 32), blocking or altering traffic is restricted on weekdays between 6:00 AM and 8:15 AM, and between 4:00 PM and 6:00 PM, unless prior approval is given by The Department of Engineering.

1.6 Traffic Control

It is the sole responsibility of the contractor to make sure that barricades are placed at the excavation site when not in attendance or where the safety of the public is of concern while work is proceeding. Barricades shall meet the requirements of the latest version of the *Indiana Manual on Uniform Traffic Control Devices*. Contractor shall provide lighting of barricades on construction sites.

1.7 Street Repair/Street Patching

A. General

Finished elevation of repair should provide a smooth driving surface matching the existing grades unless directed otherwise by the Department of Engineering. In general, the minimum size of street repair/patching will be a 4' X 4' section; smaller sections will require the approval of the Department of Engineering. No more than 200 linear feet of trench top shall be open at one time.

B. Pavement Excavation

- B1. All openings shall be saw-cut with straight, neat, vertical edges and square corners. Saw cuts shall be made to a minimum of 2" depth. The cut shall be completed with a mechanical hammer and chisel starting from the center of the cut. When cutting asphalt over brick or concrete the saw cut shall be the full depth of the asphalt.
- B2. Openings shall be made so that there is no section of adjacent existing pavement with a dimension of less than 24 inches unless authorized by the Department of Engineering. Patches shall have a minimum width of no less than the depth of excavation unless a trench box is utilized. Cuts in concrete streets shall be taken out to an adjacent joint. Any variation shall require approval from the Department of Engineering.
- B3. Methods used in removal of pavement material shall not cause damage to adjacent pavement.
- B4. Where existing pavement contains reinforcing steel, the steel shall not be cut with pneumatic hammers, but shall be cut by sawing or torching.

C. Backfilling

Backfilling shall be done in accordance with the 1999 Indiana Department of Transportation Standard Specifications. The excavation shall be filled with flowable mortar or "B" borrow to a depth no more than 8" below the top surface of existing pavement. The fill shall be free from large or frozen lumps, wood and other extraneous material. It shall consist of suitable sand, crushed stone, or other approved material (**pea gravel is no longer an approved backfill material**). The fill material shall be placed in layers not to exceed twelve (12) inches, loose measurement, and each layer compacted thoroughly by approved

mechanical means. Each lift shall be compacted to at least ninety five percent (95%) of its maximum dry density.

D. Repair of Concrete Pavement

- D1. Concrete finish shall be perpendicular to the centerline of the road, with a rough broom finish.
- D2. Depth required is equal to the existing depth of pavement or 8" poured monolithically, whichever is greater, over 6" compacted aggregate #53 stone or flowable mortar.
- D3. If opening is to be more than 12 feet in length and no original joints are provided, then contraction joints must be constructed so that joint spacing is not greater than 12 feet.
- D4. Concrete streets will be doweled to existing concrete with #5 steel rods, 18" long, 18" inches apart, imbedded 9".

E. Repair of Brick Pavement

- E1. Brick streets will be repaired and restored to original condition using brick for riding surface.
- E2. Brick shall be placed over minimum 8" concrete base, placed over the compacted granular fill; or brick shall be placed over flowable fill (with the depth of flowable fill equal to depth of excavation).
- E3. Brick Removal: All bricks may become property of The City of Terre Haute at the direction of the Department of Engineering.

F. Repair of Asphalt Pavement

- F1. **Asphalt Surfaces For Cuts 20' X 20' and over:**
 - a. HMA Asphalt Concrete Pavement #11 surface shall be used.
 - b. Minimum thickness of 1.5", placed and compacted in accordance with latest INDOT Standard Specifications
 - c. 8" Concrete base required under asphalt surface, to a depth of at least 1.5" below finished grade.

- d. Tack coat must be used between asphalt surface and concrete base, as well as the sides of existing pavement surrounding the cut.

F2. Asphalt Surfaces For Cuts Under 20' X20'

- a. Use specifications for Repair of Concrete Pavement (Section 1.7-D, page 4). If street has been paved within the last three years, use specifications for Asphalt Surfaces For Cuts 20'X20' and over (Section 1.7-F1, page 4).
- b. Concrete pavement that has been overlaid with asphalt shall be considered as asphalt pavement for repair.

G. Repair of Aggregate Pavement

Compacted aggregate #53 limestone shall be placed where existing alley roadbed is white rock or other stone material. The depth of the compacted material shall be minimum 6 inches.

H. Temporary Street Repair/Patch

Between November 1 and April 1 streets may be temporarily repaired by using approved backfill methods within eight (8) inches of the surface and placing cold mix asphalt in maximum three (3) inch lifts to be compacted with a mechanical tamp. Final repair shall be made by removing the temporary patch and repairing as per material requirements. Final repairs shall be made by May 1.

1.8 Material Specifications

A. Concrete Specifications

- A1. Concrete used shall be 7 bag mix, class "C" with 5-8% entrained air and a slump no more than 4 inches.
- A2. Test beams may be required by the Department of Engineering with minimum 550 PSI break strength before opening to traffic. Cost of preparation and testing is the responsibility of the contractor.
- A3. Concrete mix shall provide compressive strength of 4,000 PSI after 28 days.
- A4. Concrete shall be placed with uniform depth.

- A5. Concrete shall meet any and all applicable 1999 INDOT specifications for placement of Portland Cement Concrete.
- A6. As soon as newly placed concrete acquires an initial set, an approved method of curing shall be initiated which will not discolor or disfigure the pavement. Curing methods approved include white membrane as specified in INDOT sections, 501.17(e). Concrete shall not be left exposed for more than thirty (30) minutes during the curing period. When white membrane curing is used, after the concrete has been finished, the entire surface of the concrete shall be cured by mechanically applying thereon a uniform coating of the curing compound. The compound shall be type 2, in accordance with AASHTO M-148 white pigmented compound. The compound shall be applied in a continuous uniform film by means of a spraying or distributing device no less than one gallon per 150 square feet of surface.
- A7. Concrete shall be closed to traffic for a period of 48 hours when the temperature is above 50 degrees F and for a period of 72 hours when the temperature is below 50 degree F.
- A8. Concrete placements at temperatures below 35 degrees F, will be permitted only at the approval of the Department of Engineering.
- A9. Transverse and longitudinal joints and outer edges of the pavement which are part of the replaced concrete shall be edged with an edging tool having a radius $\frac{1}{4}$ ".

B. Brick

Contact the Department of Engineering for information on brick paving material.

C. Asphalt

Asphalt material shall be hot mix asphalt in accordance with INDOT Specifications, Section 400 – asphalt pavements.

D. Aggregate

Compacted Aggregate #53 limestone shall be used in accordance with INDOT Specifications, Section 303 and 904.02.

1.9 Sidewalks, Curbing, Ramps, and Driveways

A. Sidewalks

- A1. Sidewalks shall be placed so that the edge away from the street is on the street right-of-way line or shall be in alignment with existing adjacent sidewalk. Any variation from this guideline will require specific approval from the City Engineer or his assigned agent.
- A2. Sidewalks shall be five (5) feet wide, four (4) inches thick with medium broom finish. Concrete shall be well troweled to prevent spalling and other defects. Sidewalks shall be installed with tooled construction joints, minimum, 1/3 depth of concrete, on 5' centers with an approved expansion joint to be installed every 40' and where new sidewalk abuts existing sidewalk, or other fixed objects, such as curbs, drainage structures, water meters, etc. Typical sidewalks are shown in Detail 6.4 (page 38).
- A3. Sidewalks less than five (5) feet in width shall require approval of the Department of Engineering. Sidewalks placed within the public right-of-way shall have a minimum width of three (3) feet, in compliance with the Americans with Disabilities Act. In general, sidewalks to be replaced shall match the width of existing sidewalk.
- A4. Sidewalks placed through driveway sections shall be 6" thick through the driveway section.
- A5. Sidewalks placed adjacent to parking lots, or other large paved surfaces, shall have 6" curbing placed between the sidewalk and parking lot (except at entrances and exits) to prevent traffic flow onto the sidewalk and tree row areas.
- A6. Sidewalks shall be replaced in whole sections. Under no circumstances will the replacement of a partial section be allowed.

B. Curbing

Curbing will be combined curb and gutter as illustrated in Detail 6.1 (page 33). Concrete shall have a light broom finish. When matching to existing, care must be taken to transition the last 2 linear feet of curbing to the existing conditions.

C. Curb Ramps

Curb ramps will be installed per Indiana Department of Transportation Specifications at repair locations. Acceptable ramps are shown in Details 6.2A & B (pages 34 & 35). Ramps should have a rough broom finish and remain unpainted. All curb ramps shall meet or exceed current ADA standards. INDOT curb ramps Type B, E, and F shall not be used on new construction unless field conditions warrant their use.

D. Driveway Approaches

D1. Residential Driveways

- a. Residential driveways shall be concrete, and shall have the matching type of existing curbing (if any) with a 10' minimum to 20' maximum width. Driveway aprons shall be doweled to existing curb with #5 rebar, spaced 18 inches on center, when driveway is not placed monolithically with curbing. See Details 6.5A & B (pages 39 & 40) for more information.
- b. The portion in the right-of-way, including where it is part of the sidewalk, shall be a minimum of 6" thick.
- c. In areas where no curbing exists along the street, no curbing shall be placed in the radii (or wings) of the driveway within the public right-of-way.

D2. Commercial and Industrial Driveways

- a. Commercial driveways shall be concrete; the width shall be 12' to 15' for one-way traffic and 24' to 30' for two-way traffic. The Department of Engineering shall be provided with site plans showing elevations and water drainage for two hundred (200) feet in all directions. The site plans should also detail all existing intersections located within one hundred (100) feet of the proposed drives. Entrances will not be allowed within 40' of the intersection. Driveway aprons shall be doweled to existing curb with #5 rebar, spaced 18 inches on center, when driveway is not placed monolithically with curbing.
- b. The portion of the driveway in the public right-of-way, including the sidewalk section shall be a minimum 8" thick.

- c. In areas where no curbing exists along the street, no curbing shall be placed in the radii (or wings) of the driveway section in the public right-of-way. This rule does not apply when curbing is placed along the street as part of the commercial or industrial development. Typical driveway layouts are provided in Details 6.5A & B (page 38 & 39).

E. Utility Strip/Tree Row

- E1. Tree rows should be restored with a minimum 4 inches of topsoil matching adjacent elevations, and should have seed and straw or sod as specified.
- E2. A right-of-way permit will be obtained for tree work (planting, pruning, removal) within the public right-of-way. Once the tree has been removed, the stump shall either be removed or be ground a minimum eight (8) inches below the surface grade. The disturbed area is to be filled with suitable topsoil.

1.10 New Roadway Construction

Streets that are constructed with the intent to be adopted as city streets will be constructed with sidewalks, curbs, and drainage as specified herein and in accordance with the City Code. Contractor shall submit plans and specifications of new roadway with typical cross sections for approval to the Department of Engineering. A licensed surveyor or engineer must certify all plans. Typical cross sections can be found in construction Details 6.6 and 6.7 (pages 41 and 42). The Department of Engineering shall review the plans and, if acceptable, send a notice of plan approval to the contractor. A representative from the Department of Engineering shall be present for a roll test of subgrade material and during placement of the pavement. A 48-hour notice for inspection is required. Once the roadway has been placed, the contractor shall make a written request to the Board of Public Works for acceptance. The Department of Engineering shall perform a final inspection of the roadway and provide a recommendation to the Board. Roadway will be accepted with 3-year warranty, excluding minor defects.

Chapter Two: Standards and Specifications for Installation of Stormwater Control

2.1 Overview

A. Purpose

The purpose of this chapter is to ensure the proper design and construction of stormwater control devices, so as to minimize the impact of development on neighboring properties and public sewers, and to provide for the public health and safety. One property owner's right to develop his or her land does not supercede adjacent owners' rights to maintain their property in its current state.

B. Use of Storm Sewers

Only a portion of the City of Terre Haute is currently served by dedicated storm sewers. In areas where storm sewer does exist, use of the storm sewer will be allowed by a direct connection of the proposed line into the existing system, provided there is adequate capacity. Connection to existing sewer will be by the standards set out for connection to sanitary sewers as stated in Section 3.3 (page 15). In all other areas, stormwater control will be by a retention or detention system. **Under no circumstances will combined sewers be utilized for additional collection of stormwater.** All stormwater will be retained on site except where approved discharge points exist.

2.2. Submittals

Before any construction may commence on any property other than a single family residence, the Department of Engineering must give approval of the following:

A. Stormwater Drainage System Application

Any construction which changes the hydrologic nature of the site will require the submittal of an Infrastructure Plan Review Form found in Chapter 5, Form 5.2, page 29.

B. Drainage Plan

A proposed drainage plan shall contain, at minimum, the following:

1. North arrow
2. Scale (minimum 1"=50')

3. Site location map
4. Existing and proposed contours or sufficient spot elevations
5. Limits of watershed affecting the site
6. All existing and proposed structures, with elevations
7. Erosion control when applicable
8. Location and type of all surfaces, both existing and proposed
9. All stormwater structures, with adequate description of each
10. Certification by a registered architect, engineer, or surveyor
11. Storage volume of detention/retention structures
12. Plan and profile drawings for any proposed public storm sewer, at
1"=50' horizontal and 1"=5' vertical
13. Detail drawings as necessary for clarity

It is not necessary that all the above information be contained on one plan sheet.

C. Design Calculations

Design calculations should be clear and concise. Written explanations of calculations should be added wherever necessary for clarity. Computer output need not be included. In addition, a brief written narrative shall be included that explains the existing and proposed site conditions and how stormwater will be handled by the proposed design.

2.3 Design Standards

A. Determination of Runoff Quantities

Runoff quantities shall be computed for the area of the parcel under development plus the area of the watershed flowing into the parcel. In all cases, the Rational Method is to be used. The designer shall use generally accepted coefficients and rainfall intensities for this region. The storm duration for the purpose of pipe sizing shall correspond to the time of concentration from the most remote part of the drainage area under consideration. The time of concentration shall be determined by the Soil Conservation Service (SCS) time of concentration method. Flow rates in storm sewers should be calculated using the Manning Formula.

B. Runoff to be Accommodated

Design of various portions of a stormwater control system require the use of different return periods as follows:

- B1. Stormwater inlet points must be sized to accommodate peak flow from a 10-year storm.
- B2. Parking spaces must be free from standing water during a 10-year storm.
- B3. Stormwater pipes must accommodate peak flow from a 25-year storm, with a minimum diameter of 12".
- B4. Drywells, detention ponds, and retention ponds shall be designed and constructed to operate without failure in the 25-year storm.
- B6. All proposed public roadways must be free from standing water in the drive lanes during a 25-year storm.
- B7. All buildings must be elevated to be free from flooding during a 100-year storm.

C. Impact on Adjacent Properties

All stormwater on or flowing to the site after development must be retained. Exceptions will only be considered when unusual circumstances require variance from these standards or where an approved discharge point exists. In these cases, sufficient evidence must be submitted to the Department of Engineering demonstrating that a discharge from the site is necessary, and that the discharge will not have a negative effect on adjacent property during or after any rainfall.

D. Detention/Retention Facilities

Stormwater may be stored in any of the following, individually or in combination:

- D1. Drywells, individual or interconnected

Detail 6.3 (page 37) shows a typical drywell. Volume of the drywell should be such that the structure plus the void space in the surrounding aggregate will contain the short duration storm corresponding to the time of concentration, with no allowance given to ground infiltration. In addition, it should be designed such that the storage volume plus the infiltration rate will contain the 24-hour storm.

- D2. Detention/Retention ponds

Ponds shall be designed such that they will contain the 24-hour storm. If the pond will have standing water for more than 24 hours after the design storm, a

five (5) foot fence shall be placed around it. The maximum allowable side slope shall be 3:1 with a 5:1 slope recommended for ease of maintenance. Those ponds designed to retain water at a specific elevation shall have a level area of no more than one (1) foot water depth and no less than five (5) foot width along the entire perimeter of the pond.

D3. Oversized stormwater pipes

D4. Underground storage tanks or cisterns

D5. Ditches or grassy areas, for a maximum of 12 hours after the 10-year storm

Where an approved discharge point exists, stormwater may be released into it. The Department of Engineering must specifically approve any increase in discharge over the predevelopment rate.

2.4. Workmanship and Materials

The specifications for the construction of storm sewers shall not be less stringent than those set forth in the latest edition of the Indiana Department of Transportation's Standard Specifications.

Storm sewer manholes, inlets, and catch basins shall be constructed of masonry, cast in place concrete, or precast reinforced concrete. Drywells shall be constructed of precast reinforced concrete. Material and construction shall conform to INDOT's Standard Specifications, Section 720.

Pipe and pipe joints shall conform to INDOT's Standard Specifications, Section 715.

2.5. Inspection and Acceptance

A. Private Systems

Those systems that will remain on private property shall be maintained by the property owners whose land the system lies within. The City will not consider accepting as its own any storm sewers, ditches, or drywells that lie on private property. All detention and retention ponds will remain private, and shall be placed on private property. In the case where a pond, ditch or drywell serves more than one property, and is to be privately maintained, sufficient evidence of a legal agreement to maintain such a structure must be submitted to the Department of Engineering before any construction begins.

The Department of Engineering may at any time during or after construction inspect any private drainage system for compliance with the approved plans as well as these specifications. If it is determined that work is not in compliance, that maintenance or repair is needed, or that the system is insufficient, the property owner will be required to take the appropriate action to remedy the situation.

B. Public Systems

In order for a stormwater control system to be accepted by the City of Terre Haute, it must meet all of the following criteria:

1. It must be entirely within existing or proposed right-of-way.
2. It must pass all inspections by the City. Inspections required for storm sewers will be the same as those for sanitary sewer as explained in Section 3.3 (page 15), with the exception of the air test.
3. Certified as-built plans must be submitted to the Department of Engineering.
4. The developer must make a written request to the Board of Public Works after work is completed asking that the storm sewer be accepted.

The Board of Public Works will consider the acceptance of storm sewer only if all other infrastructure is complete or the development is sufficiently bonded to cover the cost of any remaining construction.

C. Changes in Plans

Whenever a change is made to the approved plans, the changes shall be resubmitted to the Department of Engineering for review and approval.

Chapter Three: Sanitary Sewer Construction Specifications

3.1 Overview

The purpose of this chapter is to ensure the proper design and construction of sanitary sewer systems and to provide for the public health and safety. These specifications serve as a guide for developers and are not intended to address every possible situation. Developers who intend to use alternative specifications and procedures are required to have such approved by the Department of Engineering before construction may begin. The Department of Engineering understands that unique situations may require variances from these specifications and procedures and will provide the necessary guidance and assistance in the best interests of construction and design integrity, public health and public safety.

3.2 License and Bond Requirements

Refer to Section 1.2 (page 1) in these specifications for license and bonding requirements.

3.3 General Construction Procedures

- A. The developer/owner shall check for the availability of sewer service in the proposed construction area and receive permission from the Department of Engineering to increase the capacity of the system.
- B. A written agreement shall be entered into between the developer and the City of Terre Haute through its Board of Public Works. This shall define the contract terms for the construction of sanitary sewers within the Sanitary District of Terre Haute. This agreement shall be obtained before any construction begins.
- C. The developer shall furnish the Department of Engineering with preliminary design plans for review and approval at least thirty (30) days before the proposed starting date of the actual construction and within ninety (90) days of signing a written agreement to construct new sanitary sewers.
- D. The plans and design shall conform to all applicable State and City specifications regarding design and construction of such sewer systems.
- E. The plans shall be stamped and signed by an Indiana licensed professional engineer. In addition, an Indiana licensed surveyor may approve *gravity only* type systems.

- F. All plans shall include but not be limited to the following:
1. Cover page showing the location, project name, designer, owner, and other pertinent information about the project overview
 2. Plan design
 3. Profile design
 4. Construction details
 5. Lift station details if applicable
 6. Proposed lateral locations (8.5" x 11" sheet in table format)
 7. All necessary easements, right-of-ways, and lot numbers for plan design
 8. All pages shall be 24" x 36"
 9. All drawings shall not be less than 1" = 50' scale
- G. Preliminary plans should be computer generated original drawings but may be blueprint copies.
- H. All final as-built drawings must be computer-generated drawings (ie: C.A.D.).
- I. Final as-built plan sets shall include 2 blueprint copies, 1 original set, and 1-3.5" computer C.A.D. disk file.
- J. The developer shall ensure all necessary easements are obtained, properly recorded, and on file with the Vigo County, Indiana Recorders office. All easements shall be for the use and benefit of the Sanitary District of the City of Terre Haute. Such easements shall be shown on all final as-built plan drawings.
- K. After the preliminary plans have been reviewed and approved by the Department of Engineering, construction may begin. The Department of Engineering shall be given at least three (3) days notice to schedule necessary construction inspection. Work shall not commence without proper notice. Any work that has been accomplished without inspection and covered may be regarded as unacceptable.
- L. Any actual construction changes to the proposed design must first be approved by the Department of Engineering. Such changes must be noted upon the construction drawings. All final field measurements shall be noted on the construction plans for "as-built" information.

- M. All service taps (laterals) shall be carefully measured in reference to the center of iron manhole castings and recorded in table form. These measurements shall be submitted to the Department of Engineering along with all final as-built drawings. Linear distances shall be measured from the downstream manhole. In addition baseline (lateral length) measurements shall be included.
- N. The following performance tests are required by the contractor/developer and shall be witnessed by a representative of the Department of Engineering:
1. Air pressure tests
 2. Mandrel alignment tests
 3. Lift station pump capacity test
 - Force main pipe hydrostatic test
 - Light test (unless installed using a laser level)
 - Manhole Vacuum Test
- O. The following performance tests will be conducted by a representative of the Department of Engineering:
1. Visual manhole inspection
 2. Video camera inspection
 3. Any other quality control inspection during or after construction
- P. The acceptance of the sewer systems and extensions by the City of Terre Haute will be based upon the following criteria:
1. The owner/developer must fulfill the conditions set forth by the Agreement signed with the Board of Public Works.
 2. The system shall be required to pass all tests and inspections required by the Department of Engineering.
 3. As-Built plans and lateral information must be submitted to the Department of Engineering prior to acceptance.

3.4 Materials Acceptable for Construction of Gravity Sanitary Sewers

The following materials are minimum requirements for use during the construction of public sanitary sewer systems in the Terre Haute Sanitary District. Material requirements shall not be limited to these standards. All materials used shall conform to but not be limited to ASTM, ANSI, IDEM standards for testing and construction of gravity sanitary sewers in Indiana. Refer to Section 3.7 (page 20) for materials not specified as follows.

Pipe: Polyvinylchloride (PVC), Reinforced Concrete Pipe, Ductile Iron Pipe, Truss Pipe and High Density Polyethylene Pipe (HDPE)

Manholes: Pre-Cast reinforced manholes including bases, risers/barrels, cones and flat slabs constructed of Class A concrete. Manhole steps shall be provided. Manholes shall be a minimum of 48" diameter for pipe up to 24". For larger pipes, the minimum diameter shall be 60".

Monolithic (Cast-in-Place) manholes designed by a registered Professional Engineer. Manhole steps shall be provided. Designed sizes shall conform to those for Pre-Cast manholes.

Castings: The type of frame and cover used shall be Neenah Foundry Company R-1772 or equal. The cover shall be labeled "Sanitary Sewer". Variations and larger sizes must be approved by the Department of Engineering.

Riser Rings: Pre-Cast adjusting rings ranging from 2" to 12" shall be used for the accomplishment of adjustments in casting elevation.

3.5 Force Main Sewer Minimum Design Requirements

The following materials are minimum requirements for use during the construction of public sanitary sewer systems in the Terre Haute Sanitary District. Material requirements shall not be limited to these standards. All materials used shall conform to but not be limited to ASTM, ANSI, IDEM standards for testing and construction of force main sanitary sewers in Indiana. Refer to Section 3.7 (page 30) for materials not specified as follows.

Pipe: PVC that conforms to ASTM D-2241. Joints shall be bell end or push-on type

Ductile Iron Pipe that conforms to ANSI A21.51 and AWWA C-151 with mechanical, slip or flanged joints.

Pumps: Pumps shall be manufactured by the following or an approved equivalent:

Submersible - Flygt, Hydro-Matic or Myers
Grinder - Flygt, Hydro-Matic or Myers

The pump manufacturer shall warrant the pumps for a period of five years. The contractor, through the manufacturer, shall provide one set of spare parts including an impeller, upper and lower seal assembly, upper and lower bearing assembly, wear rings and two sets each of O-rings and gaskets.

Station: All components of the lift station that are exposed to weather shall be constructed of material that is resistant to corrosion and will not require surface protection throughout the expected life of the lift station. In general, these materials are stainless steel, aluminum, fiberglass reinforced polyester and ultraviolet stabilized PVC.

Exception: Lifting Chains - Stainless Steel only
Guide Rails - Stainless Steel or Fiberglass
Guide Rail Hangers - Aluminum or Stainless Steel

The availability of all spare parts shall be within a one hundred (100) mile radius of the City of Terre Haute.

Controls: All pump stations shall have a duplex automatic pump control panel in NEMA 4X enclosure for outdoor mounting.

The controls shall allow automatic and manual operation of all pumps simultaneously or independently.

There shall be both audio and visual high water alarms for the pump station with silencing controls located in the NEMA 4X enclosure. In addition, all pump stations shall incorporate the use of radio telemetry warning systems for operating failure. Such systems shall be electronically compatible with those used by the Terre Haute Waste Water Treatment Plant. Contact the Department of Engineering for this information.

Sealed float type mercury switches shall be supplied to control pump operations and alarm signals.

Valves: All types of operational valves used shall meet the requirements of design, material and workmanship for AWWA C500 latest edition. An emergency bypass valve shall be placed in the valve pit.

3.6 Tapping Brick Mains

In all cases of connecting to the Terre Haute sanitary sewer system, every effort shall be made to not disturb aging mains constructed of brick. Brick sewer mains constructed around the turn of the century are usually fragile and are generally difficult to perform heavy construction on or around. However, if no other reasonable means of providing sanitary service is available, tapping brick mains will be allowed with the written permission of the Department of Engineering. In these cases, careful consideration shall be given to the quality and workmanship of all construction. In addition, the Department of Engineering will perform increased inspection to ensure that all work is

in accordance with standard practices and additional directions, if any, given by the City Engineer.

3.7 Consideration of Alternative Materials

If an owner/developer wishes to utilize pipe or construction materials not specified within this document, he or she must submit written notification of such intentions along with all pertinent specifications showing that the material in question meets all of the strength and quality requirements of those materials specified. This information shall be reviewed by the Department of Engineering and accepted or rejected based upon the information and data submitted. If the material request is denied, the Department of Engineering may request consideration of other acceptable materials for construction use.

3.8 Increasing the Flow of Existing Sewer Systems

In all cases of increasing the flow of existing sewer systems, the owner/developer shall submit the expected flow increase data and obtain written permission from the Department of Engineering to cause such an increase. This requirement shall allow the Department of Engineering to examine the existing system and determine if any overloading or surcharging will result from such additions.

3.9 Prohibited Uses of Sewer Systems

In no circumstance shall storm water or any other form of natural water runoff be allowed to enter the Terre Haute sanitary sewer system. Crawl space drains, footing drains and gutter downspouts may not be connected to sanitary sewer. However, sump pumps and basement floor drains are acceptable for sanitary sewer connection. Additional information has been provided for storm water management in Chapter 2.

In addition, the discharge of hazardous materials or potentially damaging substances into the sanitary sewer system is strictly prohibited. These substances may require on-site pretreatment by the owner before such discharge will be allowed into the sanitary sewer system. Rules and regulations set forth by the Indiana Department of Environmental Management and the City of Terre Haute Code manual shall be used to determine if any discharge is hazardous or otherwise damaging to the integrity of the sewer system operated by the City of Terre Haute. Please contact the Department of Engineering for any concerns regarding hazardous material discharge.

3.10 Abandoning Existing Sewer Systems

Existing sewer systems currently owned and maintained by the City of Terre Haute may be abandoned only by a special written request to the Terre Haute Board of Public

Works and the Terre Haute City Engineer. Such requests will only be granted to property owners adjacent to such sewers when it can be shown that the existing sewer provides service to only those requesting abandonment. Those proposing abandonment shall agree to accept said abandoned sewer and therefore supervise and maintain all applicable sewer lines and appurtenances.

3.11 Work in Highway, Railroad or Utility Right-of-Ways

The contractor shall obtain and prepare all necessary permits from highway, railroad and utility authorities for proposed construction and operations relative to the scope of the work. The contractor shall comply with all codes and regulations of the agencies involved when working on their property. Required permits, codes, repair specifications and regulations regarding work within the right-of-way boundaries of the City of Terre Haute are described in Chapter 1 of these specifications.

3.12 Multi-Phase Subdivisions

When sanitary sewers are constructed in coordination with the development of multi-phase subdivisions, separate Agreements with the Board of Public Works for the construction of sanitary sewers in each phase shall be created and executed according to the provisions in the agreement. Additionally, all construction plans and documentation shall be created independently for each phase.

3.13 Typical Detail Drawings

Typical detail drawings, as listed below, have been provided in Chapter 6 of these specifications. These drawings have been provided to supplement the information of Section 3.4.

- A. Figure 6.10 Typical Pre-Cast Manhole Detail
- B. Figure 6.11 Cast Iron Frame and Cover Detail
- C. Figure 6.12 Cast Iron Manhole Step Detail
- D. Figure 6.13 Typical Lift Station Detail
- E. Figure 6.14 Pipe Backfill Detail

Chapter Four: Residential/Commercial Sewer System Connections

4.1 Overview

The purpose of this chapter is to ensure the proper design and construction of sanitary sewer connections and to provide for the public health and safety. These specifications serve as a guide for contractors and homeowners and are not intended to address every possible situation. Contractors and homeowners who intend to use alternative specifications and procedures are required to have such approved by the Department of Engineering before construction may begin. The Department of Engineering understands that unique situations may require variances from these specifications and procedures and will provide the necessary guidance and assistance in the best interests of construction and design integrity, public health and public safety.

4.2 License and Bond Requirements

Refer to Section 1.2 (page 1) in these specifications for license and bonding requirements.

4.3 New Lateral Connections

If a residential/business connection is made to a public sewer owned and maintained by the City of Terre Haute, the property owner shall be required to sign and purchase a "*Sewer Tap Agreement*" at the Board of Public Works (Room 204, City Hall). The Board of Public Works has established tap fees for residential/business occupancies. Fees associated with connection are listed in Form 5.4 of Chapter 5, page 31.

In addition, the property owner shall be required to purchase and provide a \$10.00 "*Sewer Tap Construction Permit*" available from the Board of Public Works. This permit shall remain on-site at all times until the inspection of the connection is complete.

If the connection requires work within the public right-of-way, a right-of-way construction permit must be obtained by the Department of Engineering, Indiana Department of Transportation, or the Vigo County Highway Department depending on the work location. This permit shall remain on-site until the public right-of-way has been restored according to the required specifications of the controlling agency.

All connections shall require inspection before backfilling. The Department of Engineering will provide inspection for all connections. Inspections are scheduled by contacting the Department of Engineering at (812) 232-4028. All inspections should be scheduled with a minimum of four (4) hours notice.

4.4 Materials for Lateral Connections

All new sewer laterals shall be constructed using Polyvinylchloride (PVC) pipe. The minimum diameter for all laterals shall be six (6) inches. The pipe shall have compound cell classification 12454A as defined and described in ASTM D-1798. The pipe strength/diameter ratio shall not be less than SDR 35 and shall conform in all respects to the dimensional requirements of ASTM D-3033 or D-3034.

Extra strength vitrified clay pipe will only be allowed to repair existing clay laterals and may not be used for any new construction. It shall meet the requirements of ASTM designation C700.

4.5 Workmanship for Installation

- A. All plastic shall be installed closely following the guidelines of ASTM D-2321, "Standard Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe".
- B. The building sewer shall be constructed at no less than the minimum uniform grade for the size of pipe used (**1/8" fall/foot minimum for six (6) inch pipes**) and installed in a straight line. Any change in slope or direction shall be accomplished with the proper angled pipe joints (22.5°, 45° elbows). Four (4) inch pipes will be allowed to exit a structure for a maximum of thirty-six (36) inches.
- C. No building sewer lateral shall be laid parallel within three (3) feet of any bearing wall. The minimum depth of the pipe at any point shall not be less than eighteen (18) inches. A thirty (30) inch depth is recommended for protection against freezing conditions.
- D. At least one six (6) inch cleanout riser shall be installed for each six (6) inch building sewer lateral. This cleanout shall be accessible from the outside of the building. No portion of the lateral shall exceed one hundred (100) feet without additional cleanouts. A cleanout must also be installed whenever the lateral makes necessary 90-degree angle directional changes. This cleanout must be installed immediately before or after the 90-degree angle fitting. All cleanouts shall remain accessible from ground level.
- E. The building sewer shall be placed in firm soil. The trench floor shall be shaped to support the lower quadrant of the barrel of the pipe.

- F. All pipe joints shall be made tight and waterproof through the use of O-ring sealed pipe or by using PVC pipe glue for non-O-ring pipe.
- G. Unstable trench bottoms must be stabilized before laying pipe. A sufficient depth of unstable soil shall be removed and replaced with a bedding of processed stone, sand or gravel and properly graded. The depth of the processed material depends upon the severity of trench bottom soil conditions. If the foundation soil contains significantly large particles in proportion to the size of the pipe, a bedding of acceptable material shall be provided above the trench floor.
- H. Pipe shall be laid in the uphill direction with the bell end of the pipe upgrade. Efforts shall be made to allow the lettering printed on the pipe wall to face up to allow the inspector visibility for inspection.
- I. The trench should be backfilled manually to the top of the pipe directly after being passed by the inspector. This will allow the pipe to retain a proper alignment. Manual compaction is recommended for the full length of the pipe barrel. Caution shall be taken to prevent bedding material from being forced under the pipe thus causing vertical displacement and slope change.
- J. Every effort shall be made to install a separate lateral for separate buildings. However, in special circumstances, with the approval of the Department of Engineering, additional buildings may be connected in accordance with Section 9-75 part C of the City of Terre Haute Municipal Code.
- K. When a structure is too low to permit gravity flow to a public sewer line, wastewater must be lifted and transported by a private forced sewer main system. Guidelines for a private force main system are given in the following section.
- L. All connections shall be made at existing lateral stubs provided. *Fernco* or *Mission* type adapters shall be utilized to connect existing plumbing. If a lateral does not currently exist, the owner may be required to expose the sewer main line and make an appropriate connection in the right-of-way. An approved saddle connection for the type of main pipe is required for this installation. The owner may also connect at a nearby manhole if main line connections are not feasible. All manhole connections shall require an approved drop section inside the manhole. All manhole connection requests must be examined and approved in writing by the City Engineer or his/her designee.

- M. The Department of Engineering will provide the owner/contractor with all available lateral location information. It shall be noted that certain older addresses have vague or no information at all. Every effort will be made to provide the most accurate information possible.
- N. Lateral clean-out caps, openings and piping shall be installed within the private property boundaries. Clean-outs are not allowed within the right-of-way limits unless authorized by the Department of Engineering.

4.6 Private Single Structure Force Main System Requirements

Small diameter pressure sewer systems incorporating the use of individual home grinder pump units will be allowed in areas where the surrounding terrain and elevations do not allow the use of conventional gravity systems. The maintenance of the grinder pump system and the building force main to the point of connection at the public sewer shall be the responsibility of the home owner. The City of Terre Haute shall only be responsible for the publicly owned main.

Such grinder pump systems can be obtained in this area. In most cases, pump suppliers should be able to help the owner specify a system appropriate for each case. In addition, private grinder pump stations should be installed using the following recommended specifications as general guidelines. If the owner wishes to use other standards, the Department of Engineering may be contacted for review of such apparatus standards and specifications.

1. Unit may be a simplex pumping station (one pump)
2. Unit shall have a fiberglass (or polymer) twenty-four (24) inch diameter basin at least seventy-two (72) inches in height
3. The inlet of the station shall not be less than forty-eight (48) inches to protect from freezing
4. The outlet of the station shall not be less than forty-eight (48) inches to protect from freezing
5. The basin shall have a removable top for component access
6. The pump shall have a minimum rating of 2 HP, capable of at least 25 GPM
7. All discharge piping shall be Schedule 80 PVC - two (2) inches as a minimum
8. A ball type shutoff valve shall be provided for the discharge piping
9. All guides, pump rails, and hold-downs shall be structural plastic
10. A check valve shall be installed on the discharge side of the pump
11. Anti-siphon valves shall be installed for systems with negative discharge slope

12. A sealed control panel having an audio/visual high water alarm shall control the system.
13. The entire unit shall be mounted upon a six (6) inch minimum concrete slab three (3) feet in diameter

4.7 Sewer Lateral Replacement

If a property owner replaces any aging or damaged existing sewer lateral, all requirements for new lateral installation shall apply regarding materials, workmanship, inspection and work permits. Owners will not be required to purchase a "Sewer Tap Agreement" if a current agreement and/or billing account exists but shall be required to purchase a \$10 "*Sewer Tap Construction Permit*" as well as all necessary right-of-way construction permits by the governing agency (City, County, State Highway) where the work will occur.

4.8 Septic System Abandonment after New Public Sewer Connection

Owners of structures that use septic systems and make connection to public sewers are required to properly abandon said septic systems. All septic tanks and holding structures shall be emptied completely and cleaned. All empty tanks shall be filled with suitable non-contaminated material such as clean sand or gravel. Tank or pipe structures previously used for septic systems may not be utilized in the construction of new lateral connections. Further, all outlets of the tank or holding structure shall be securely sealed to prevent loss of fill material. These requirements are additional to those established by the Vigo County Health Department Regulations.

4.9 Department of Engineering Inspection of New/Replacement Laterals

All lateral construction shall be inspected by a representative of the Department of Engineering before such work is backfilled. For each inspection, the Sewer Tap Construction Permit (or photocopy) shall be provided on-site for the inspector. The inspector will conduct the inspection following the guidelines set forth by Section 4.3 (page 22). This will ensure that the owner has received quality construction and the connection will not interfere with the normal operation of the public sewer system. Upon completion, the connection will receive either a pass or fail report. The inspector will provide the results of the inspection in writing to the contractor who shall provide such results the property owner. Inspections are scheduled every half hour. A minimum of four (4) hours notice shall be required under most circumstances. Requests for immediate inspections will only be granted if the Department of Engineering inspector has adequate time available without delaying other scheduled inspections.

4.10 Tapping of Brick Mains for Lateral Connections

Refer to Section 3.6 (page 19) for information regarding brick sewer main construction.

4.11 Lateral Cap Abandonment (Cap-off)

When it has been determined that a lateral will no longer be used by a property owner, the lateral shall be taken out of service. The cap-off process shall ensure that the lateral will remain in working order and can be located for any future use. All laterals shall be saw-cut at or very near the property line. Plastic pipe shall be capped using a cap-end sized for the specific pipe. The cap shall be glued securely into place. Clay pipe shall be plugged using mortar. The mortar shall extend at least twelve (12) inches into the pipe. In addition, care shall be taken to prevent the mortar from falling into the pipe before curing has occurred. Four (4) hours notice shall be given to the Department of Engineering for all cap-off inspection scheduling. No work shall be concealed prior to inspection.

When a lateral is taken out of service due to demolition, the permit issued for building demolition shall be provided to the inspector and recorded. When a lateral is taken out of service for reasons other than demolition, a Sewer Inspection Permit shall be purchased from the Board of Public Works for the amount of \$10.00. This permit must remain on-site at all times during the process and provided to the Department of Engineering Inspector.

4.12 Determination of Provided Lateral Locations

Information regarding the location and depth of laterals for individual properties shall be provided by the Department of Engineering. The Department of Engineering will make every effort to provide the most accurate information available. In some cases, such information may be vague, incomplete or non-existent due to older records, which may not contain detailed information.

4.13 Laterals Requiring Work within Public Right-of-Ways

All construction work and restoration relative to sanitary sewer connection within the public right-of-way shall conform to the standards set forth in Chapter 1.

RIGHT-OF-WAY USE / EXCAVATION PERMIT APPLICATION

CITY OF TERRE HAUTE – DEPARTMENT OF ENGINEERING
17 HARDING AVENUE, ROOM 200
TERRE HAUTE, IN 47807
PHONE: (812) 232-4028 FAX: (812) 234-3973

ADDRESS OF PROPOSED WORK: _____
REASON FOR WORK: _____
APPLICANT: _____ LICENSE NUMBER: _____
PHONE: _____
ADDRESS: _____

TYPE OF SURFACE AFFECTED BY WORK: _____
EXCAVATION SIZE: _____

FEE

Disturbed Area (\$.25/SF, \$25 minimum)	a. \$ _____
Road Closure (\$10/Day)	b. \$ _____
Base Fee (sum of a & b)	c. \$ _____
Major Thoroughfare (50% of c)	d. \$ _____
New Road Surface (50% of c)	e. \$ _____
Total Fee (sum of c, d, & e)	\$ _____

PERMIT NUMBER: _____ DATE ISSUED: _____

DATE ACTIVATED: _____ DATE COMPLETED: _____

Applicant Signature: _____
Approved By: _____

- The permit holder shall be responsible for a period of three years from the date of completion for maintaining the area in the public right-of-way.
- Right-of-way permits will be open for a period of 90 days. Permits shall be activated within 90 day period by contacting the City Engineer's Office. Once activated permittee will have a period of five working days to excavate and restore the area to the City's Construction Standards.
- If a road closure is necessary, a written request shall be submitted to the Board of Public Works at least 10 days prior to the proposed closing date.
- Traffic control is the contractor's responsibility. Barricades, signals, and flagmen, conforming to the Indiana State Manual on Uniform Traffic Control Devices are to be provided by the contractor.
- The contractor is responsible for notifying all utilities for underground installation locations.
- The purchaser of this permit understands and acknowledges that the City of Terre Haute is in the process of updating its Public Right-Of-Way Management Plan, and as a result of such update, this permit may be a temporary permit. The City reserves the right to collect fair and reasonable compensation for the costs incurred in management of the public right-of-way necessitated by occupancy by permittees of the right-of-way. Costs for management of the public right-of-way may include, but are not limited to, permit fees, license fees and franchise fees. When the updated Public Right-Of-Way Plan is completed, the terms of the Plan shall apply to this permit and the use of the right-of-way permitted by this permit. The permittee may be required to apply for approval to be located within the public right-of-way, which application may be granted or denied as consistent with the Public Right-Of-Way Plan, with the understanding that this permittee shall be credited or reimbursed a pro rata share of this permit only.

PLEASE SKETCH PROPOSED WORK ON THE BACK OF THIS PAGE

INFRASTRUCTURE PLAN REVIEW FORM

CITY OF TERRE HAUTE - DEPARTMENT OF ENGINEERING
17 HARDING AVENUE, ROOM 200
TERRE HAUTE, IN 47807
PHONE: (812) 232-4028 FAX: (812) 234-3973

Project Name _____ Project Address _____

Owner Information

Design Firm Information

Name _____

Co. Name _____

Address _____

Address _____

Professional Engineer _____

Contact Person _____

Contact Person _____

Telephone _____

Telephone _____

Fax _____

Fax _____

Contractor Information

Purpose (please check appropriate review)

Name _____

Proposed Subdivision _____

Address _____

Commercial/Industrial Development _____

Public Roadway _____

Contact Person _____

Public Storm Sewer _____

Telephone _____

Public Sanitary Sewer _____

Fax _____

Other (Describe) _____

(Office Use Only)

Assigned Project No: _____

Date of Submittal _____

Site and Drainage Plan _____

Sewer Tap Agreement # _____

Drainage Calculations _____

Cap-Off Inspection # _____

Work within ROW ft². _____

Lateral Inspection # _____

Traffic Impact _____

Drive Access _____

Easements _____

Reviewed By _____

Comments Attached _____

NOTICE OF VIOLATION

On the ____ day of _____, 20____, the right-of-way work you performed at _____, Terre Haute, Indiana was inspected by this office and was found to be in non-compliance with the Standards and Specifications set by the Board of Public Works.

Permit Number: _____

Comments on Violation: _____

Upon completion of the work it shall be the duty and responsibility of the permittee to fill, replace, and repair such openings in the streets that the permittee has opened according to plans and specifications of the City of Terre Haute. The permittee shall be responsible for maintaining the cut to adhere to all applicable standards for a period of three (3) years from the date of the inspection and approval by the City of Terre Haute.

You are hereby notified that you have ten days from the date of this notice to bring the right-of-way into compliance with the Standards and Specifications of the City of Terre Haute.

Failure to comply to with the provisions of this notice will result in further legal action pursuant to Municipal Code Chapter 8-124. A citation for an appearance in city court may be issued. The judge may impose a **\$300.00 fine per day** for each violation of the ordinance. Also, Section 8-124 of the Municipal Code gives the City the option to fix the violation and recover costs from the permittee.

Dated this ____ day of _____, 20____

Terre Haute City Engineer
or his representative

SANITARY SEWER FEE SCHEDULE

Sanitary Tap Inspection: \$10

Sanitary Tap Fees:

For connection to a sanitary sewer, such owner shall pay to the Board of Public Works and Safety a connection charge in accordance of the following schedule:

- a. **Existing Residences-** For each existing single-family residential connection the **base fee** of five hundred dollars (\$500.00), payable in equal quarterly installments over a maximum period five (5) years. A charge equal to ten percent (10%) of delinquent quarterly fees will be assessed on payments made after the due date of said payments. The unpaid balance shall be immediately due and payable upon conveyance of said property.
- b. **New Residences-** For each new single-family residential connection the **base fee** of five hundred dollars (\$500.00) payable at the time construction.
- c. **Multiple Family Residences-** Multiple family residential connection fees shall be the base fee multiplied by 0.65 multiplied by the number of units. i.e. duplex connection fee ($500 \times 0.65 \times 2 = \650).
- d. **Commercial/Industrial-** All other structures not covered in the above should be based on the following connection fee schedule:

Domestic Water Meter Size (inches)	Connection Fee
5/8	base fee
3/4	1.5 times base fee
1	2.5 times base fee
1 1/2	6 times base fee
2	10 times base fee
3	23 times base fee
4	41 times base fee
6	case by case

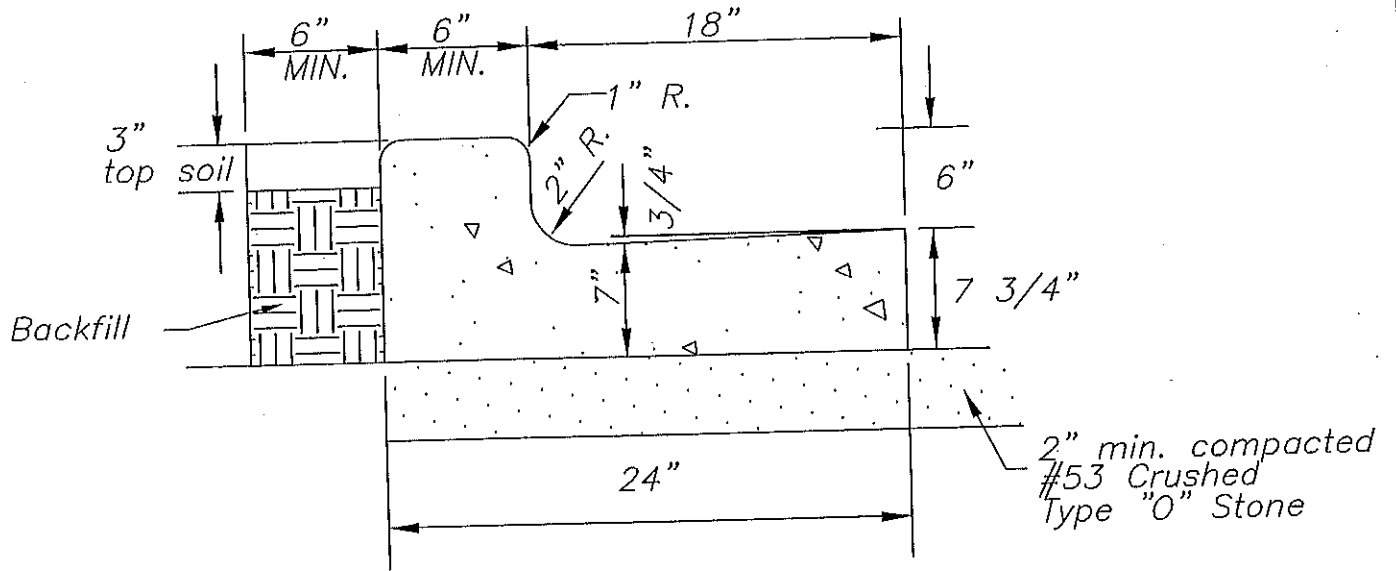
Note: If an additional or larger meter is installed for an existing non-single family residential customer, a connection fee shall be assessed based on the following formula, Additional flow generated by the customer divided by flow generated by average single family residential customer multiplied by the base fee.

Form 5.5

MAJOR THOROUGHFARES WITHIN CITY LIMITS

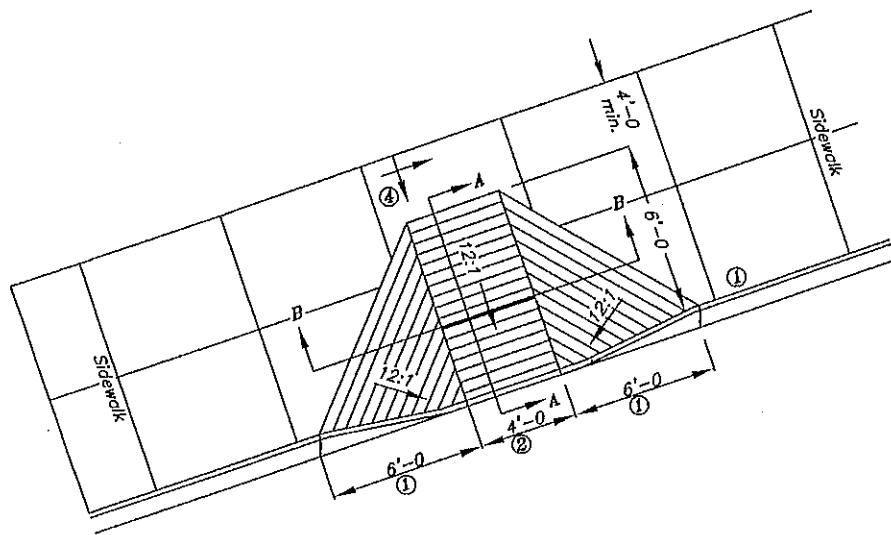
Street	From	To
1st Street (North)	Wabash Avenue	8th Avenue
1st Street (South)	Wabash Avenue	Hulman Street
4th Street (North)	Wabash Avenue	Cherry Street
4th Street (South)	Wabash Avenue	Poplar Street
5th Street (North)	Wabash Avenue	Cherry Street
5th Street (South)	Wabash Avenue	Poplar Street
6th Street (North)	Wabash Avenue	Cherry Street
6th Street (South)	Wabash Avenue	Poplar Street
7th Street (North)	Wabash Avenue	Fort Harrison Road
7th Street (South)	Wabash Avenue	Royce Drive
8th Street (North)	Wabash Avenue	Cherry Street
8th Street (South)	Wabash Avenue	Poplar Street
8th Avenue	1st Street	25th Street
9th Street (South)	Poplar Street	Hulman Street
13th Street (North)	Wabash Avenue	Haythorne Avenue
13th Street (South)	Wabash Avenue	Margaret Avenue
19th Street (South)	Wabash Avenue	Margaret Avenue
25th Street (North)	Wabash Avenue	Lafayette Avenue
25th Street (South)	Wabash Avenue	I-70
Blakely Avenue	Wabash Avenue	Locust Street
Davis Avenue	3rd Street / U.S. 41	Canal Road
Fruitridge Avenue (North)	Locust Street	Haythorne Avenue
Fruitridge Avenue (South)	Wabash Avenue	I-70
Fort Harrison Road	3rd Street / U.S. 41	Fruitridge Avenue
Haythorne Avenue	3rd Street / U.S. 41	Fruitridge Avenue
Honey Creek Drive	S.R. 63	3rd Street / U.S. 41
Hulman Street	3rd Street / U.S. 41	S.R. 46
Lafayette Avenue	Tippecanoe Street	Haythorne Avenue
Locust Street	1st Street	Blakely Avenue
Maple Avenue	3rd Street / U.S. 41	Fruitridge Avenue
Margaret Avenue	S.R. 63	S.R. 46
Ohio Street / Boulevard	11th Street	Fruitridge Avenue
Poplar Street	1st Street	S.R. 46
Wabash Avenue	3rd Street / U.S. 41	9th Street
Walnut Street	3rd Street / U.S. 41	19th Street

COMBINED CURB & GUTTER



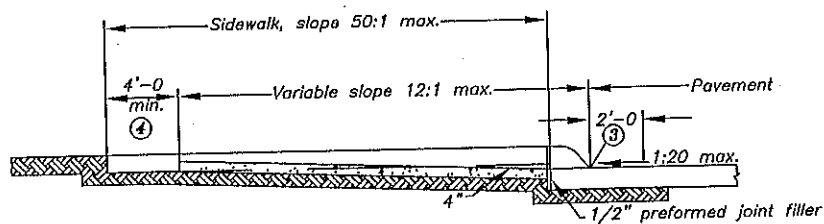
COMBINED CURB & GUTTER

CURB RAMP DETAIL

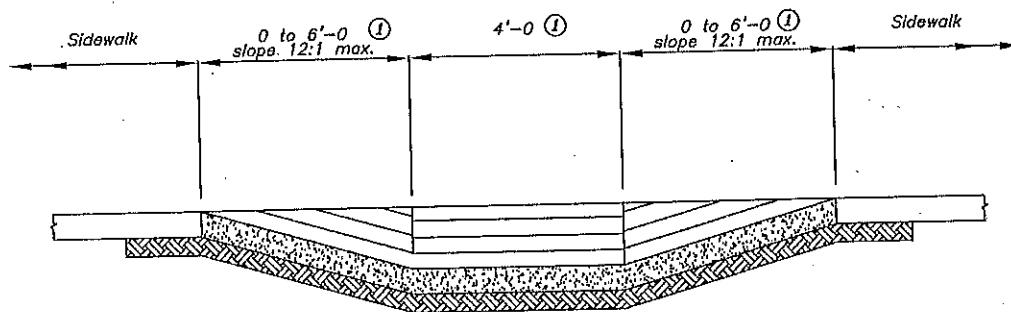


GENERAL NOTES

- ① These dimensions are based on a 6" curb height, and shall be proportionally adjusted for other curb heights.
- ② A 3'-0" minimum width ramp may be used when existing space prohibits the construction of the 4'-0" wide ramp.
- ③ The bottom edge of the curb ramp shall be flush with the edge of the adjacent pavement and gutter line.
- ④ Landing areas at the top of curb ramps shall have maximum slope of 1:50 in any direction.

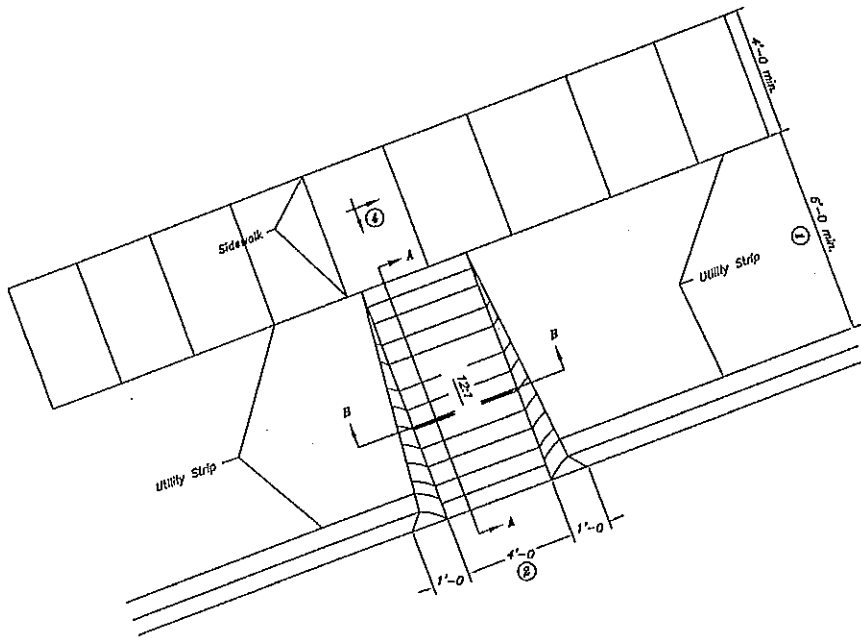


SECTION A-A

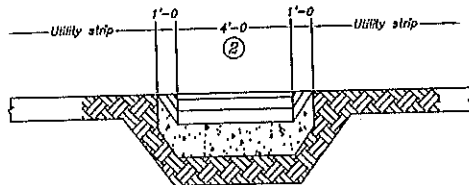
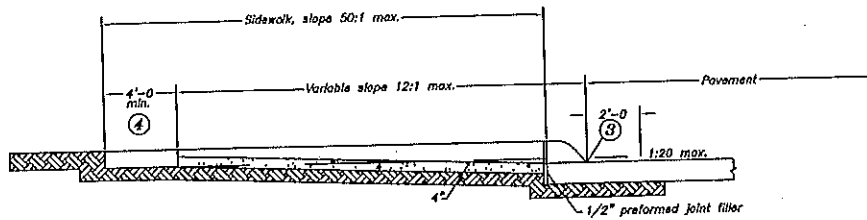


SECTION B-B

CURB RAMP DETAIL



CURB RAMP, TYPE C



SECTION B-B

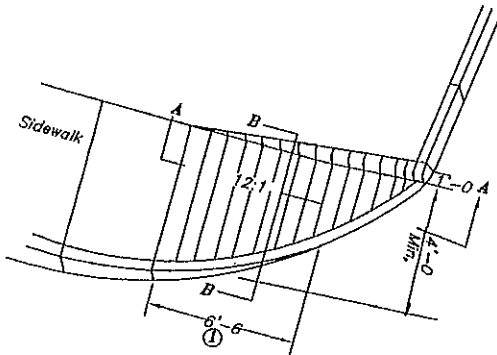
GENERAL NOTES

- ① These dimensions are based on a 6" curb height, and shall be proportionally adjusted for other curb heights.
- ② A 3'-0" minimum width ramp may be used when existing space prohibits the construction of the 4'-0" wide ramp.
- ③ The bottom edge of the curb ramp shall be flush with the edge of the adjacent pavement and gutter line.
- ④ Landing areas at the top of the curb ramps shall have maximum cross slope of 1:50 in any direction.

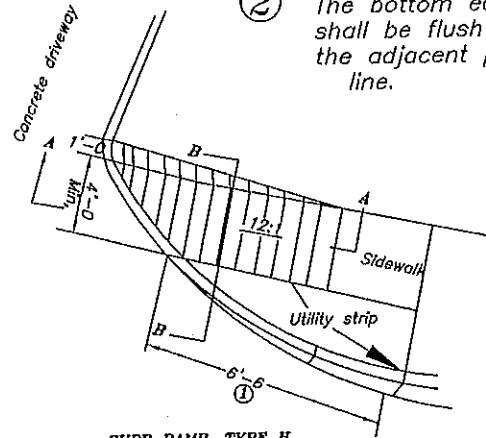
CURB DETAIL

GENERAL NOTES:

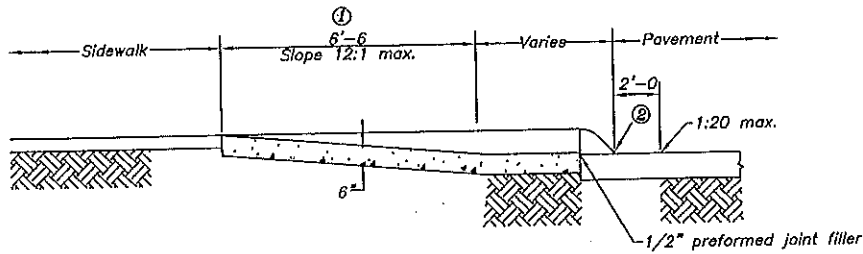
- ① These dimensions are based on a 6" curb height, and shall be proportionally adjusted for other curb heights.
- ② The bottom edge of the curb ramp shall be flush with the edge of the adjacent pavement and gutter line.



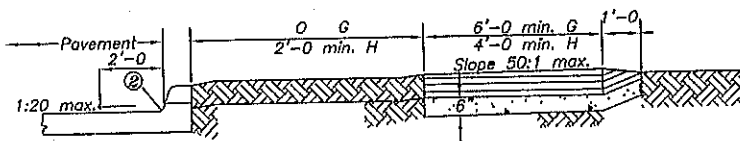
CURB RAMP, TYPE G



CURB RAMP, TYPE H

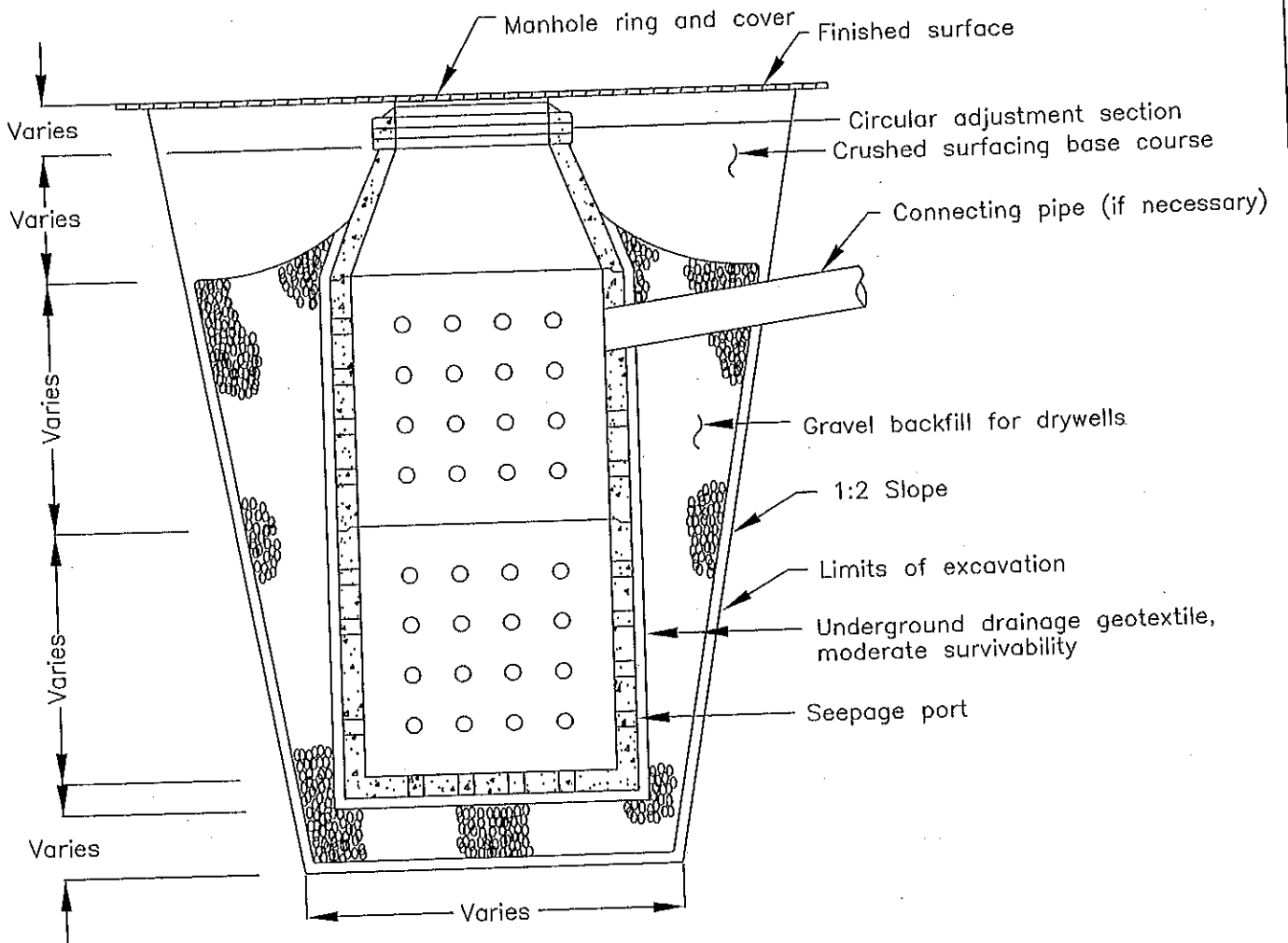


SECTION A-A (Reversed for Type H)



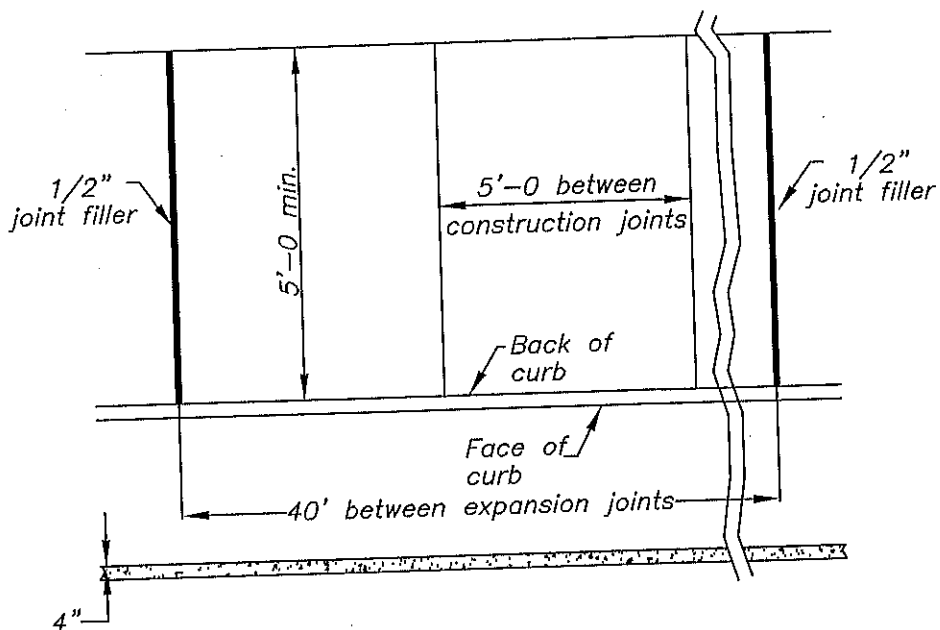
SECTION B-B (Reversed for Type H)

DRYWELL

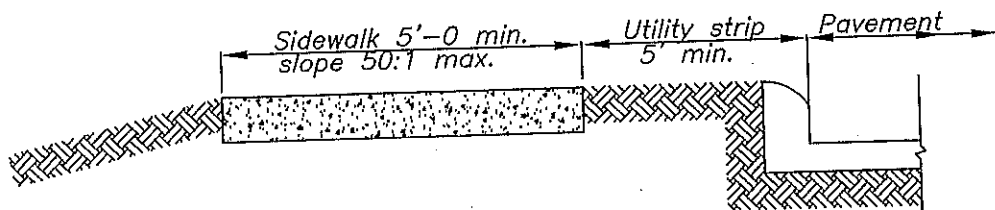


Note: All dimensions vary based on design

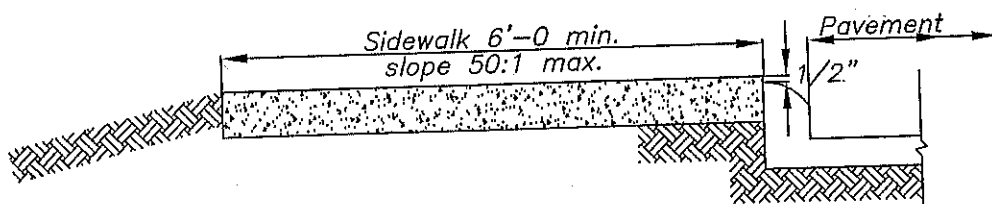
SIDEWALK DETAILS



SIDEWALK

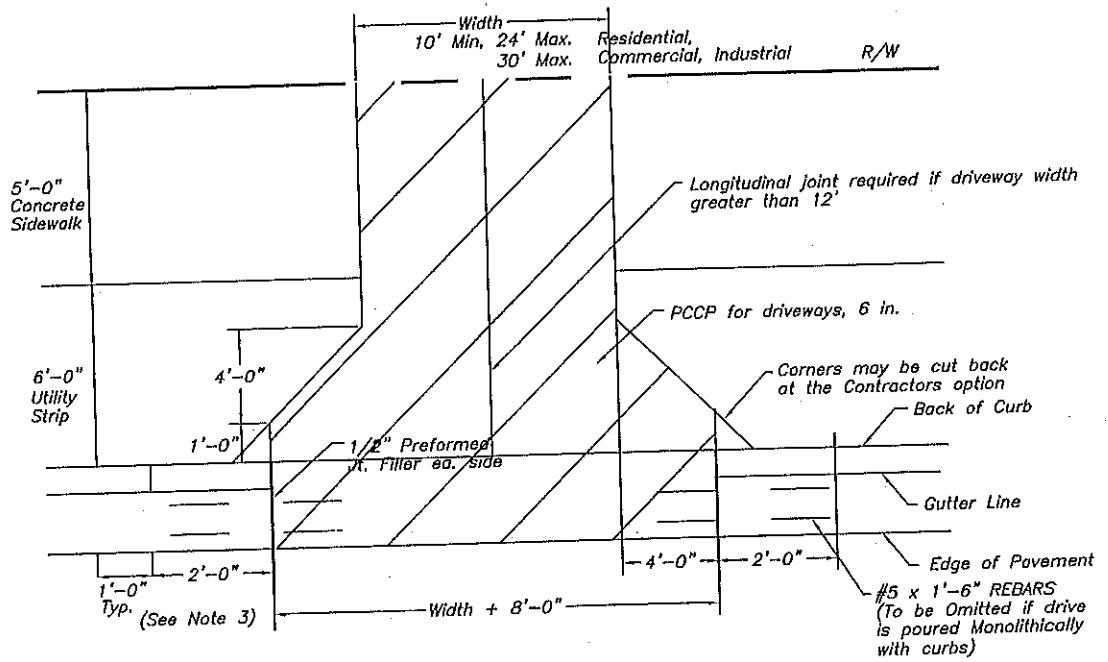


SECTION THROUGH SIDEWALK WITH UTILITY STRIP



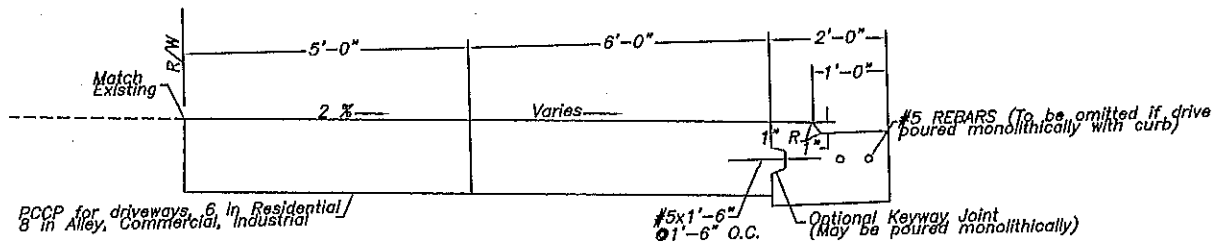
SECTION THROUGH SIDEWALK ADJACENT TO CURB

DRIVEWAY DETAIL

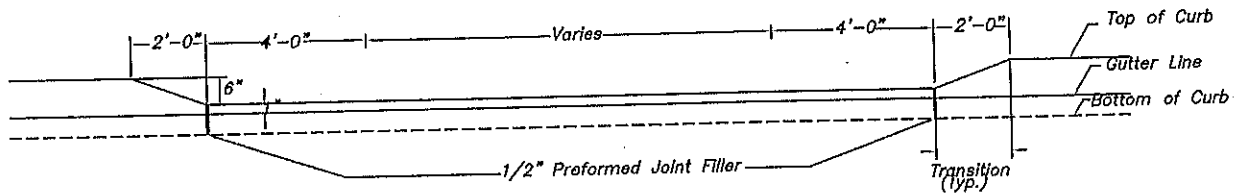


PLAN

DRIVEWAY DETAIL

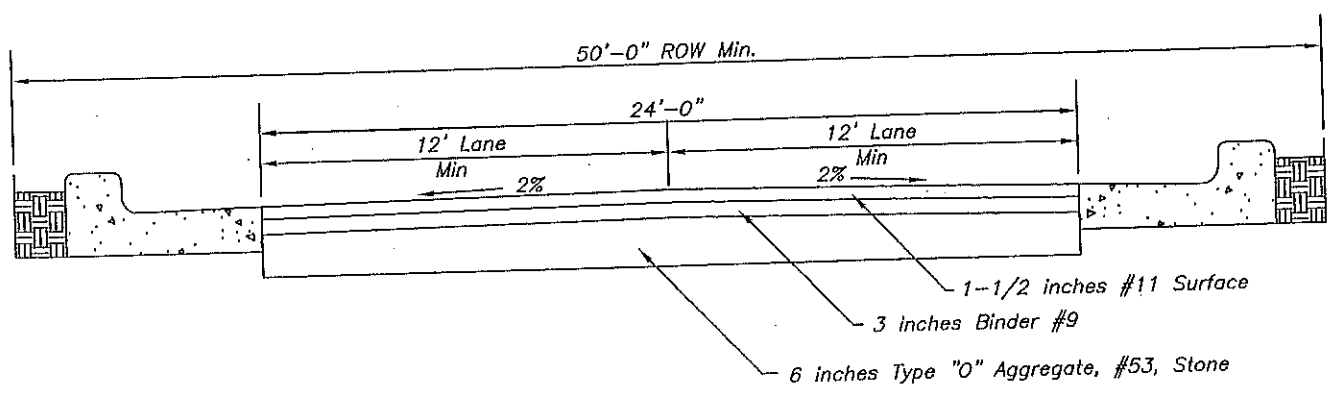


CROSS SECTION

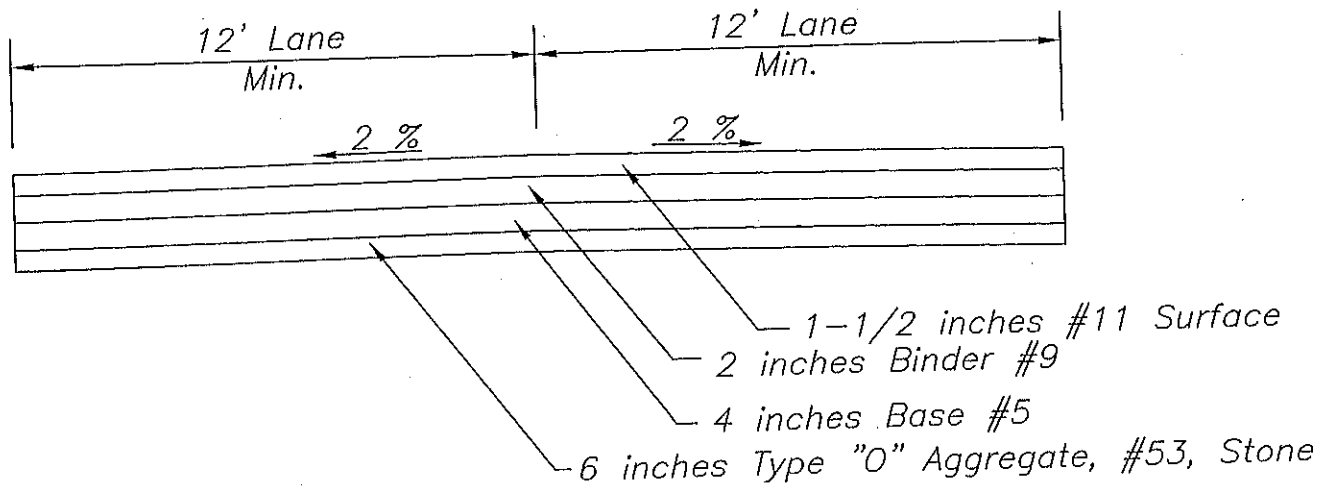


PROFILE

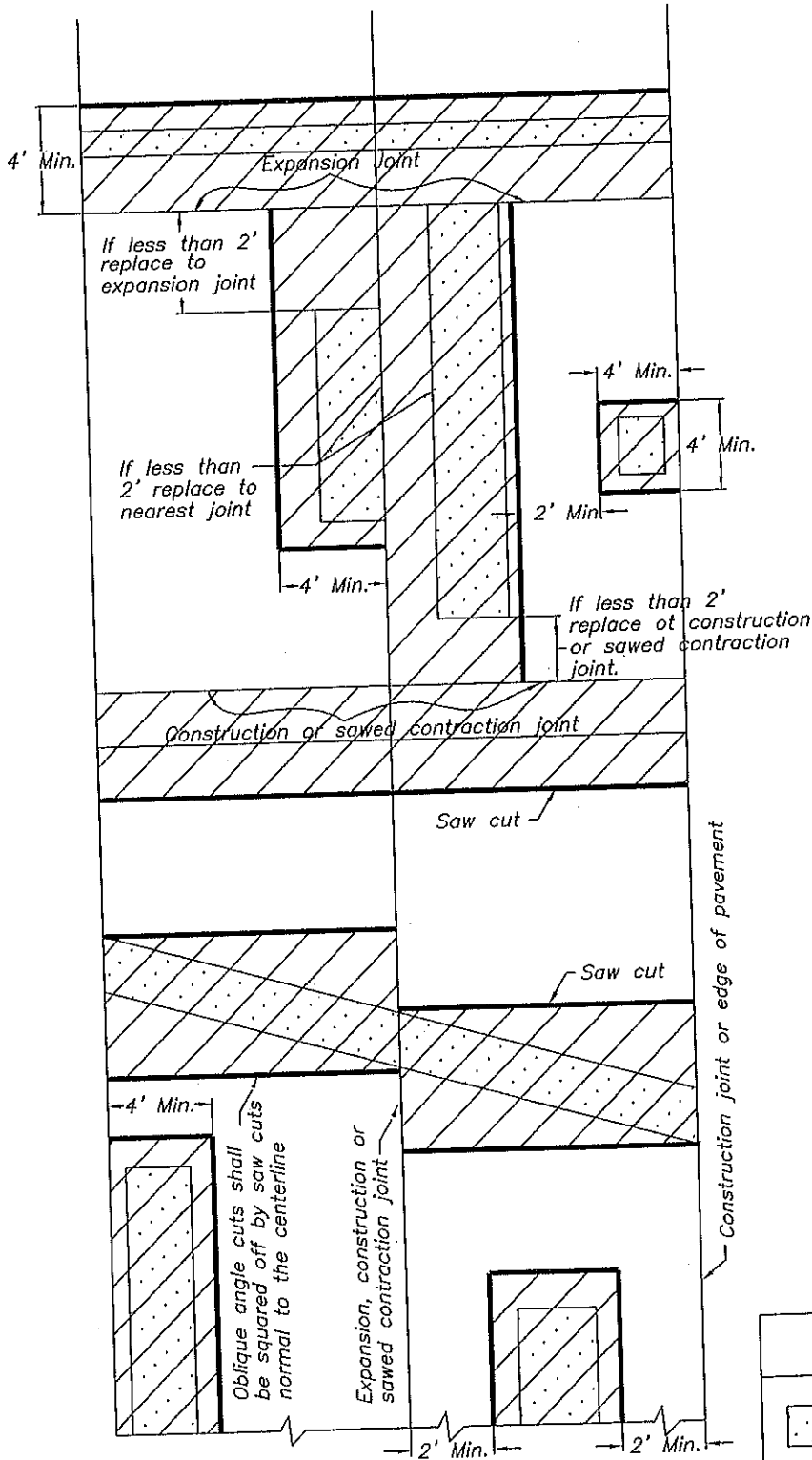
LOCAL STREET PROFILE




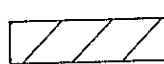

HEAVY DUTY PAVEMENT SECTION



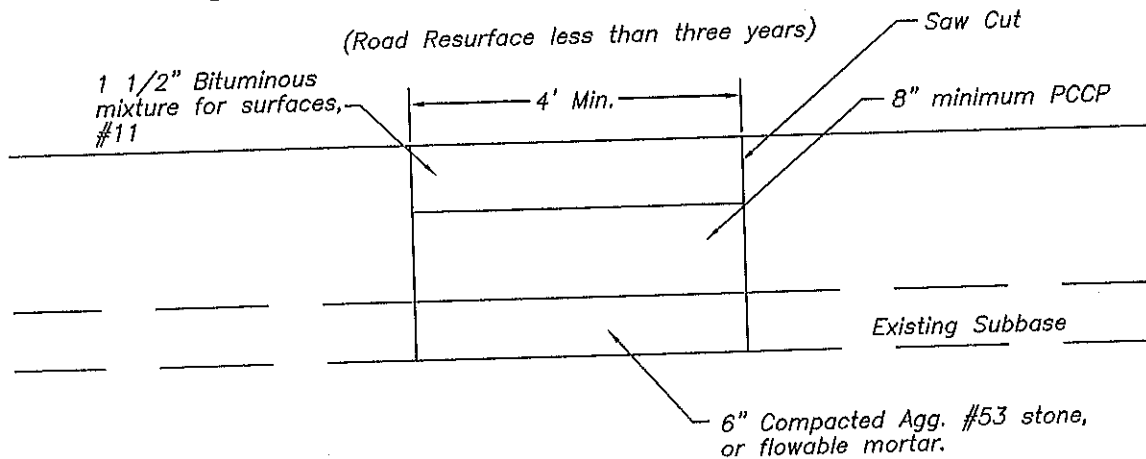
PAVEMENT REPLACEMENT DETAIL



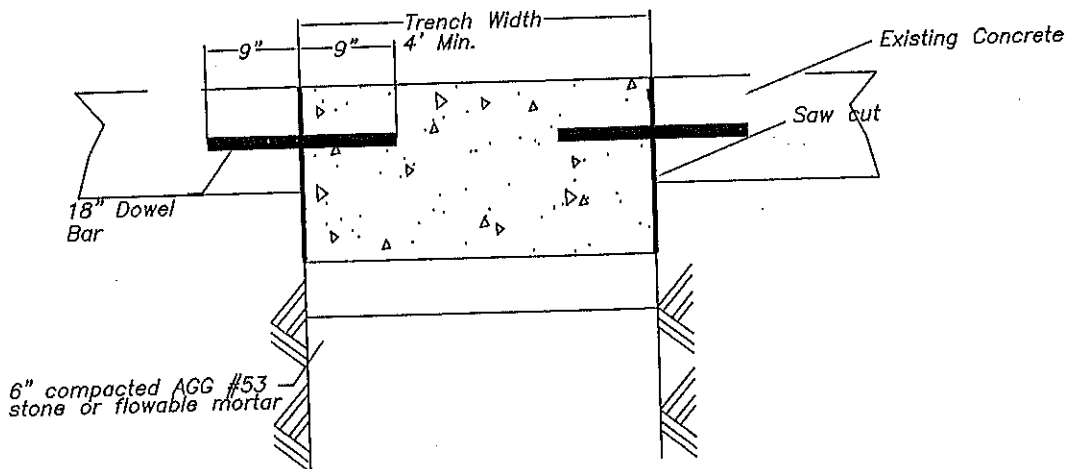
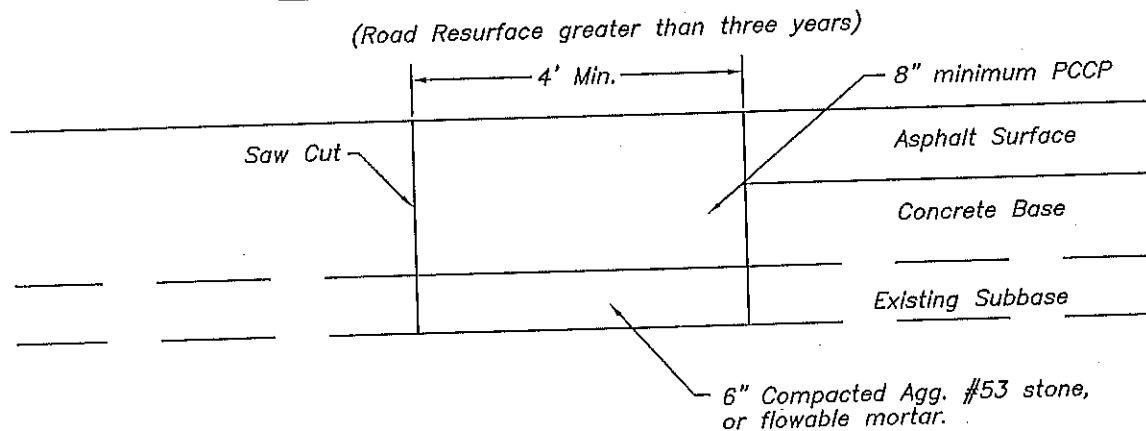
PAVEMENT REPLACEMENT DETAIL

LEGEND	
	Excavation
	Area of concrete pavement to be replaced
	Saw Cut 2" Depth Min.

ASPHALT PATCH DETAIL

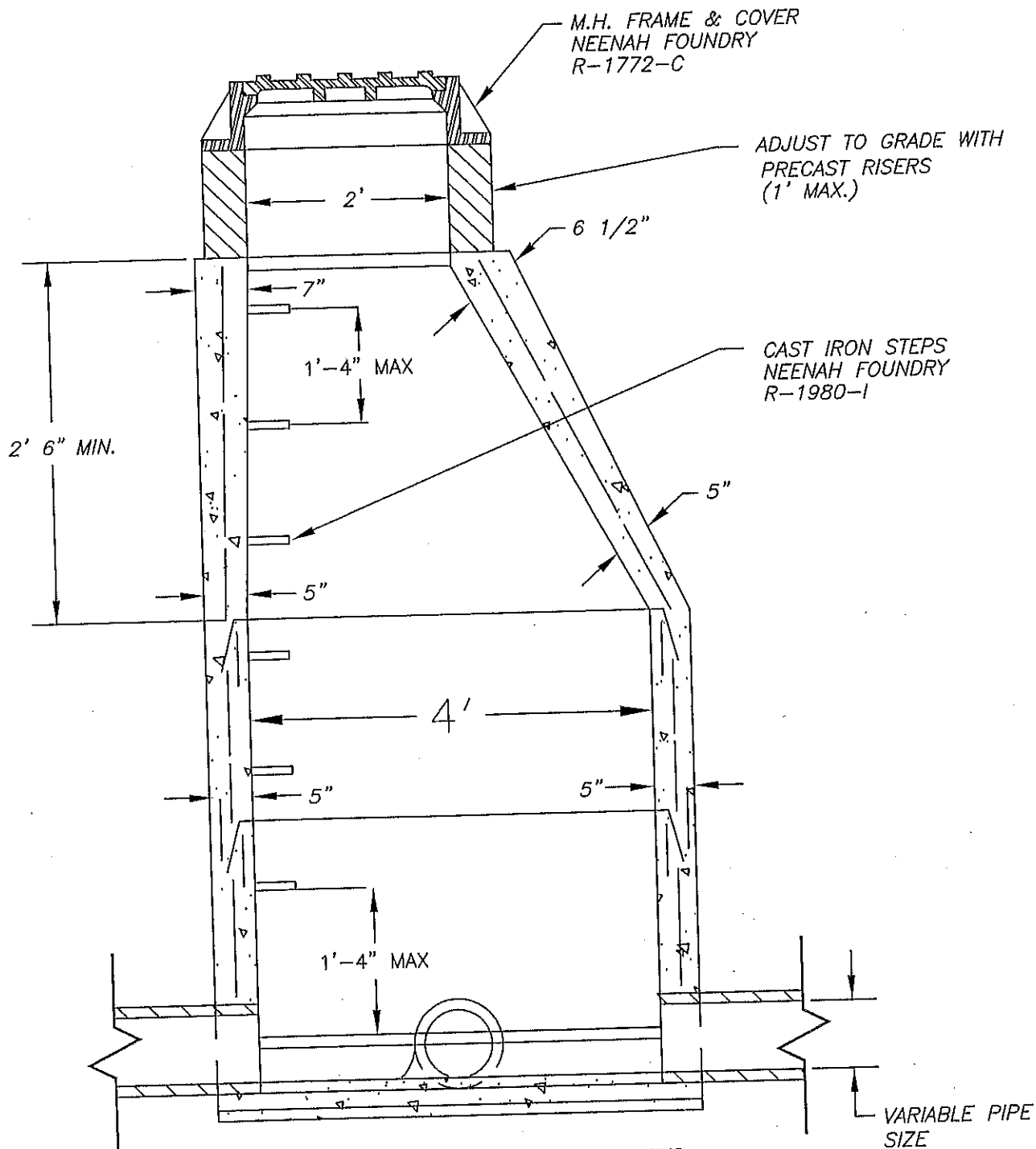


Concrete Patch Detail



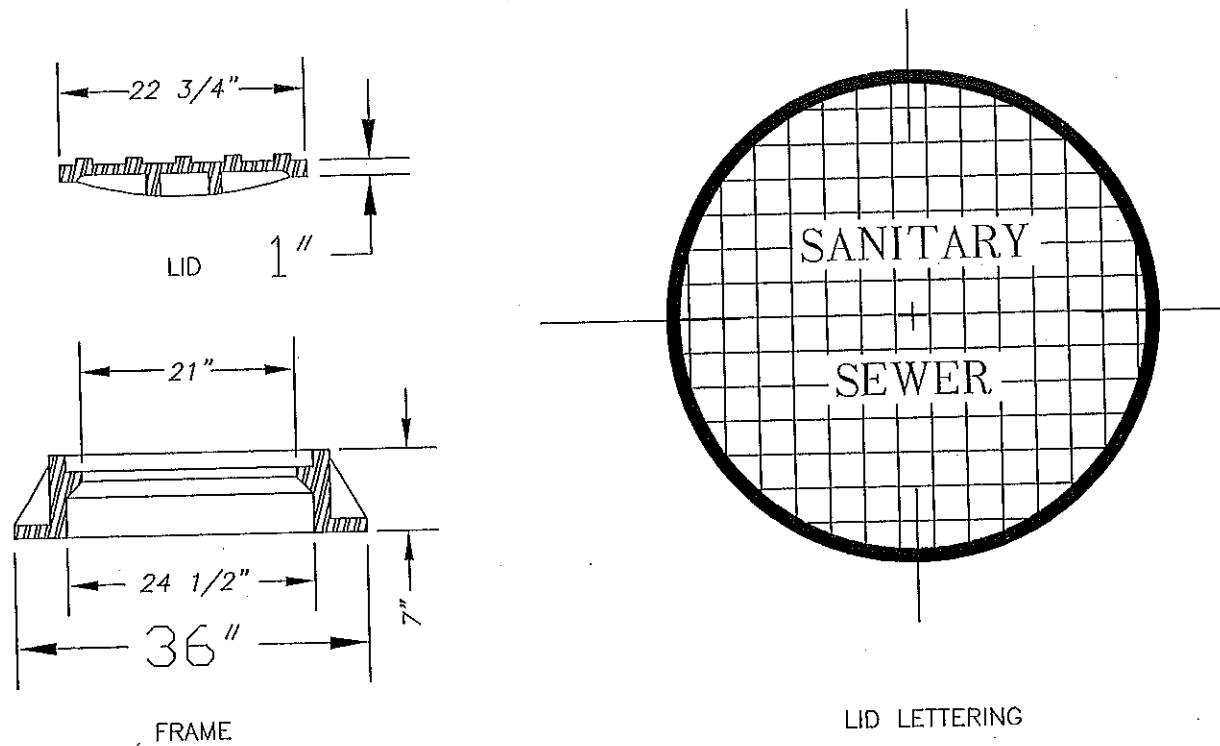
CONCRETE PATCH DETAIL

TYPICAL PRE-CAST MANHOLE STRUCTURE



NOTE: CONSISTENT WITH SURFACE COND.
 VERT. WALL OF CONE SHALL BE
 PLACED OVER THE SHELF OR
 SMALLEST PIPE.

MANHOLE FRAME & COVER DETAILS

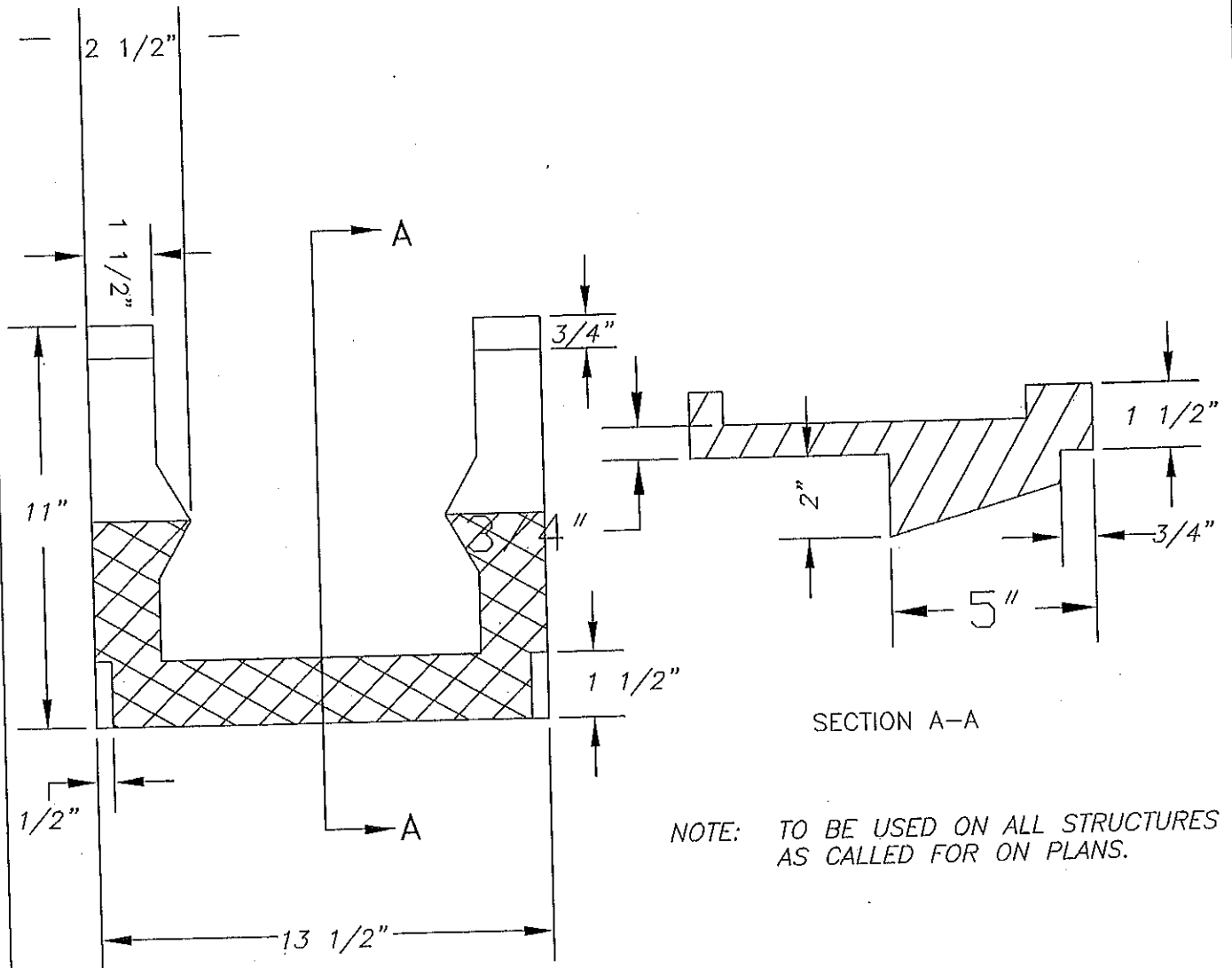


NOTES: MACHINE SEAT BETWEEN LID AND FRAME
NO RATTLE SHOULD OCCUR WHEN VEHICLE PASSES OVER.

LID LETTERING TO BE OF LARGE COMMERCIAL GOTHIC CONSTRUCTION.
USE NEENAH TYPE OR APPROVED EQUAL FOR SANITARY SEWERS.

FRAME AND LID TO BE NEENAH FOUNDRY #R-1772-C WITH
CONSEALED PICK HOLE, WEIGHT 355 LBS.

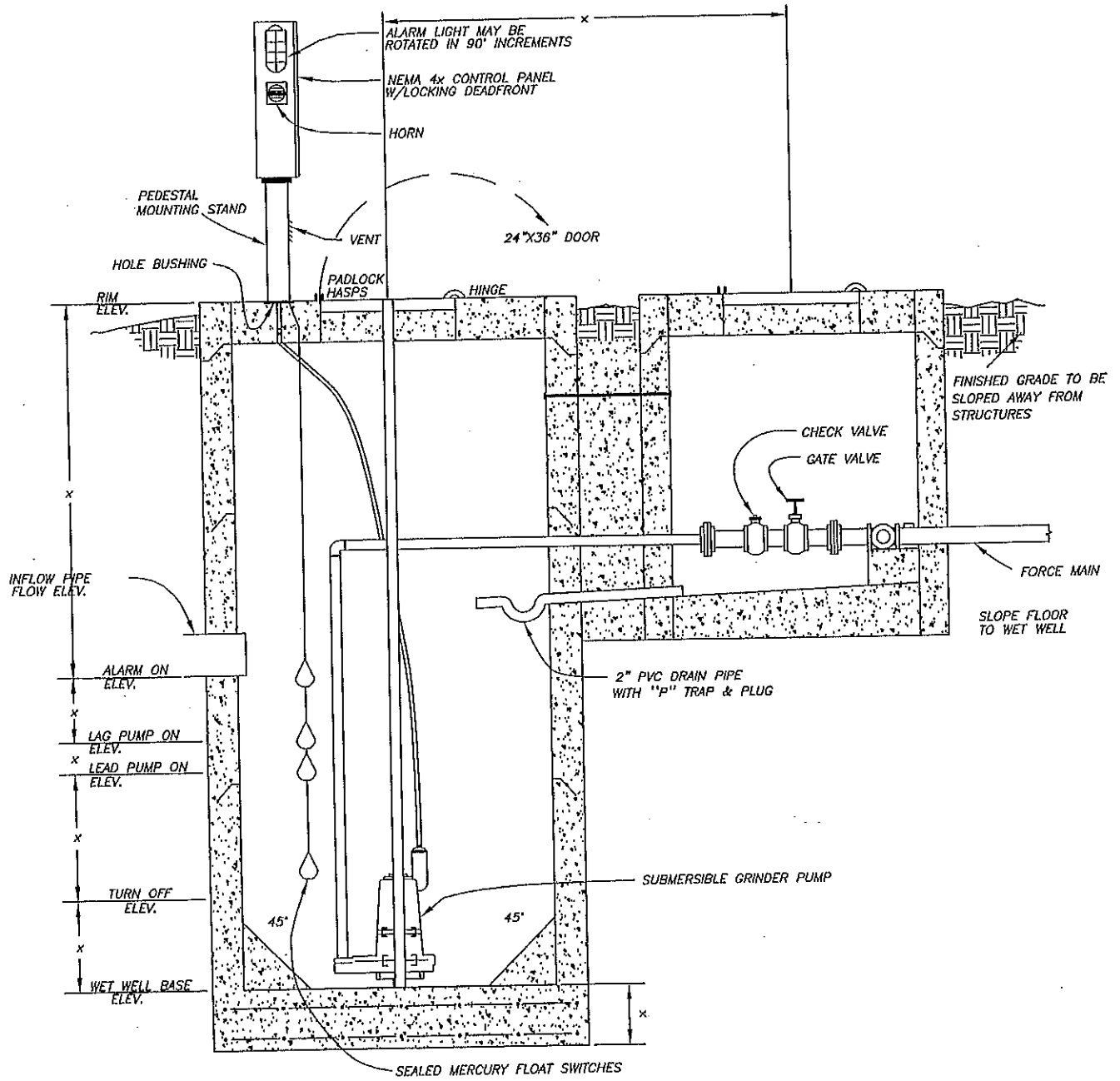
CAST IRON MANHOLE STEP DETAIL



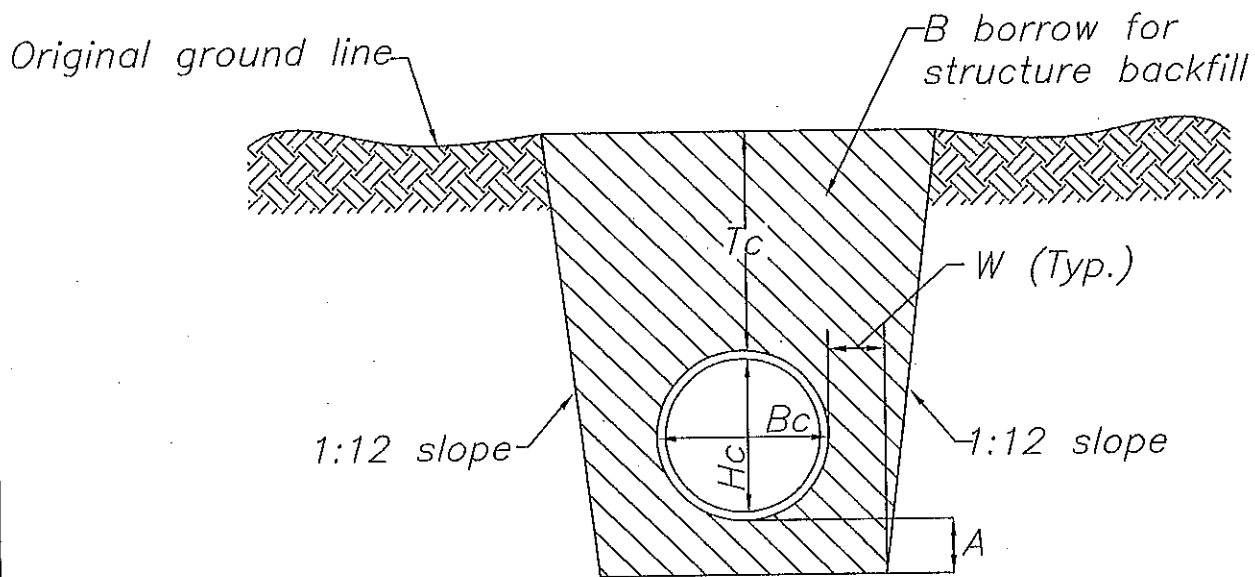
SECTION A-A

NOTE: TO BE USED ON ALL STRUCTURES AS CALLED FOR ON PLANS.

TYPICAL LIFT-STATION DETAILS



PIPE BEDDING DETAILS



LEGEND

- H_c = Overall diameter or rise
 B_c = Overall diameter or span
 A = 8" min. for fill height up to 16'
 = 12" min. for fill height of 16' or more
 T_c = Trench cover depth
 W = $0.3 B_c$ or 9", whichever is greater

GENERAL NOTES

The minimum covers are listed below:

- a.) 1.5' for $B_c \leq 18"$, where B_c = pipe diameter or span
- b.) 3' for $18" < B_c < 54"$
- c.) 4' $B_c > 54"$